<u>6</u>

Festoil-ISO 4113

# Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 FIA 1,7 f
1. Edition

VE 6/10 F 2000 R 44 0 460 406 008

Overflow temperature 45° C

supersedes

company: engine:

Fiat 8160.61

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers 0,3

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/...

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
, 1.1 Timing device travel	1800	5,2 - 5,6	mm		
1.2 Supply-pump pressure	1800	7,0 - 7,6	bar (kgf/cm²)		
1.3 Full-load delivery with	1800	39,0 -40,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
charge-air pressure Full-load delivery without			cm <sup>3</sup> /1000 strokes		
charge-air pressure  1.4 Idle regulation	400	8,0 -12,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 58,0	cm <sup>3</sup> /1000 strokes		
1.6 Start	2200	17,0 -23,0	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing	1800				

2. Test Spe	cifications	checking values in brackets (	)	
2.1 Timing device	n = rev/min	1000	1800	2000
	mm	1,7-2,5(1,4-2,8)	(4,7-6,	1) 5,8-6,6(5,5-6,9)
2.2 Supply pump	n = rev/min	400		2000
	bar (kgf/cm²)	2,2-2,8		7,6-8,2
Overflow delivery	n = rev/min	500		2000
i	cm <sup>3</sup> /10 s	55-110(40-125)		55-110(40-125)

		55-110(40-	-123)		
2.3 Fuel deliveries					4
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press. bar (kgf/cm²)	C
End stop	2300 2200 2000 1800 1200 600	42,0 -44,4	(16,0-24,0) (36,2-40,8) (37,2-41,8) (40,9-45,5) (30,0-36,0)		
switch-off	2000	0			
idle stop	500 400	max. 4,0	(6,0 -14,0)		c
2.4 Solenoid	cut-in voltage	mi	n.10 V		
	<u> </u>	<u>rated volt</u>	age 12V		_

3. Dimen	Sions for assembly
Designation	and adjustment mm
К	
KF	5,9-6,1
MS	1,7-1,9
svs	max.6,0
* FH	1,8-2,4
Ax K	
ВхГ	
Observations	
*operati	ng stroke

(cold-start accel.)

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Féderale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 FIA 1,7 c 1. Edition

VE 3/10 F 2100 R 46 0 460 403 003

Overflow temperature 45° C

supersedes

company: engine:

Fiat 8130.61.200

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

0,3

 $mm \pm 0.02(0.04)$ 

see VDT-W-460/...

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel 1.2 Supply-pump pressure 1.3 Full-load delivery with charge-air pressure Full-load delivery withou charge-air pressure 1.4 Idle regulation 1.5 Full-speed regulation 1.6 Start 1.7 Load-dependent port-closing	1500 1500 1500  350 100 2350	4,0-4,4 5,4-6,0 39,5-40,5  8,0-12,0 min.40,0 7,0-13,0	mm bar (kgf/cm²) cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes cm³/1000 strokes		2,5(3,0) 2,5(3,0)
	1500				]

2. Test Spe	cifications	checking values in brackets (	)		
2.1 Timing device	n = rev/min mm	1000 1,7-2,5(1,4-2,8)	1500 (3,5-4,9)	1800 5,0-5,6(4,6-6,0	2100 0)6,1-6,9(5,8-7,2
2.2 Supply pump	n = rev/min bar (kgf/cm²)	600 2,3 - 2,9			2100 7,5-8,1
Overflow delivery	n = rev/min cm³/10 s	500 55-110(40-125)		59	2100 5-110(40-125)

2.3 Fuel deliveries					3. Dimen	for assembly
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press. bar (kgf/cm²)	Designation	and adjustment mm
End stop	2430 2350 2100 1500 600	max.5,0 36,0-38,0 30,5-33,5	(6,0 -14,0 (34,7 -39,3 (37,7 -42,3 (29,0 -35,0		K KF MS SVS	5,9 - 6, 1,4 - 1, max. 2,
switch-off	2100	0			A B	
End stop	400-500 350 400 500	0 mind.34,0 max. 35,0	(6,0 -14,0		Observations	
2.4 Solenoid	cut-in voltage	min.	10,0 V tage 12V			

4		
	K KF MS SVS	5,9 - 6,1 1,4 - 1,6 max. 2,8
]	A	
	В	
	Observations	

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Federale d'Allemagne par Robert Bosch GmbH.

# Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 PEU 2,3 h 4 1. Edition

n

VE 4/10 F 2075 R 40-3 Overflow temperature 45° C 0 460 404 009

supersedes

Peugeot

company: engine:

XD 2,5 Autom.

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting -- mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	1400	5,0-5,4	mm	0,67	
1.2 Supply-pump pressure	1400	5,1-5,7	bar (kgf/cm²)	0,67	
1.3 Full-load delivery with	500	35,0-36,0	cm³/1000 strokes	0	2,5(3,0)
charge-air pressure Full-load delivery without	1000	47,3-49,7	cm³/1000 stroķes	0,67	
charge-air pressure 1.4 idle regulation	425	9,0-13,0	cm <sup>3</sup> /1000 strokes	0	2,5(3,0)
1.5 Full-speed regulation	100	min. 70,0	cm³/1000 strokes	0	
1.6 Start	2375	20,0-26,0	cm <sup>3</sup> /1000 strakes	0,67	
1.7 Load-dependent port-closing	1400				

2. Test Spe	citications	checking values in brackets (	)	
2.1 Timing device	n = rev/min	750	1400	2000
	mm	1,0-1,8(0,7-2,1)	(4,5-5,9)	7,7-8,5(7,4-8.9)
2.2 Supply pump	n = rev/min	400		2075
	bar (kgt/cm²)	2,4 - 3,0		6,5 - 7,1
Overflow delivery	n = rev/min	500		2075
	cm <sup>3</sup> /10 s	55 - 110(40-125)		55-110(40-125)

2.3 Fuel deliveries				
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2500 2375 2000 1750 1000 +750 500	46,6-49,0 47,3-49,7	(5,0-13,0) (19,0-27,0) (42,7-47,3) (45,5-50,1) (46,2-50,8) (39,0-45,0) (32,5-38,5)	0,67 0,67 0,67 0,25
switch-off	2075	0		
idle stop	460-590 425	C	(7,0-15,0)	
2.4 Solenoid	cut-in voltage	111 111 2	10 V age 12V	L

ions for assembly
and adjustment mm
Maß Kl
5,7-5,9
1,0-1,2
max.4,0
roke 3,5 mm. justing nut o correct.

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH.

# **Test Specifications** Distributor-type Fuel-injection Pumps

WPP 001/4 PEU 1,3d 1. Edition

VE 4/8 F 2500 L 17 0 460 484 002

Pre-stroke setting

Overflow temperature 45° C

supersedes

company:

Peugeot

engine:

XL 4 D

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers mm

Test Instructions and Test Equipment

See VDT-W-4RA

1 Cottings	Rot. speed	Settings		Characair	Ia.u
1. Settings	rev/min			Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	1600	4,3 - 4,7	mm		
1.2 Supply-pump pressure	1600	4,5 - 5,0	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1250	25,0 -26,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure			cm <sup>3</sup> /1000 strokes		
1.4 Idle regulation	400	8,0 -12,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.50,0	cm <sup>3</sup> /1000 strokes		
1.6 Start	2600	15,0-21,0	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing					

2. Test Spe	cifications	checking values in brackets (	)		
2.1 Timing device	n = rev/min mm	1000 1,7-2,7(1,5-2,9)(	1600 3,8-5,2)6,7-7,5(6	2200 ,4-7,8);	2600 7,9-8,1(7,55-8,95)
2.2 Supply pump	n = rev/min bar (kgf/cm²)	350 1,3 - 1,8		2200 - 6,5	
Overflow delivery	n = rev/min cm³/10 s	500 55-111(40-126)			2500 55-111(40-126)

2.3 Fuel deliveries				
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press. bar (kgf/cm²)
End stop	2700 2600 2450 2000 1250 600	max. 7,0 23,5-25,5 23,5-25,5 18,0-21,0	(14,0-22,0) (22,2-26,8) (22,2-26,8) (23,2-27,8) (16,5-22,5)	
switch-off	2500	0		
idie stop	450 400	max.5,0	(6,0-14,0)	
End stop	100-480 550			
2.4 Solenoid	cut-in voltage	10 rated voltag		

3. Dimens	ions for assembly
Designation	and adjustment
к	3,2-3,4
KF	5,7-5,9
MS	1,9-2,1
svs	max.4,4
A	5,8-10,8
В	9,7-14,7
Observations Clearance to position are increased to 1.5-1.0 mm	Detween idle nd stop for idling

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany. Imprimé en République Fedérale d'Allemagne par Robert Bosch GmbH.

46

WPP 001/4 PEU 1,5a
1. Edition

n

VE 4/8 F 2500 L 29 0 460 484 003

Overflow temperature 45° C

supersedes

company: Peugeot

engine:

XID

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

mm

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	2200	7,2-7,6	m/m		
1.2 Supply-pump pressure	2200	6,4-7,2	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	2000	26,5-27,5	cm <sup>3</sup> /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure			cm³/1000 stroķes		
1.4 Idle regulation	365	12,0-16,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation -	100	min. 40,0	cm³/1000 strokes		
1.6 Start	2650	9,0-15,0	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing					

2. Test Spe	cifications	checking values in brackets (	)		
2.1 Timing device	n = rev/min mm	800 1,0-2,0(0,8-2,2)	1600 4,6-5,2(4,2-	2200 5,6)(6,7-8,1)7,	2400 9-8,7(7,6-9,0)
2.2 Supply pump	n = rev/min bar (kgf/cm²)	400 1,9-2,7		2500 7,1-7,9	
Overflow delivery	n = rev/min cm <sup>3</sup> /10 s	500 55-111(40-126)	5	2500 5-111 (40-126)	•
	<del></del>	_ <del></del>			

2.3 Fuel deliveries				
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press
End stop	2750 2650 2450 2000 1250 600		(8,0-16,0) (24,2-28,8) (24,7-29,3) (24,7-29,3) (18,5-24,5)	
switch-off	2500	0		
idle stop	400 365	max.6,0	(10,0-18,0)	
End stop	100 450-550	min.40,0		
2.4 Salenoid	cut-in voltage		V Oltage 12 V	L

3. Dimens	ions for assembly
Designation	and adjustment mm
к	3,2-3,4
KF	5,7-5,9
MS	1,7-1,9
svs	max.3,0
XK	19,5-21,5
XL A	10,9-14,7
8	
Observations Clearance b position an increased i 0.5-1.0 mm	

**BOSCH** 

# Test Specifications Distributor-type Fuel-injection Pumps

40

WPP 001/4 PEU 1,5a 2
1. Edition

•

VE 4/8 F 2300 L 29-1 0 460 484 004 Overflow temperature 45° C

supersedes

company: engine: Peugeot XIDL

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/...

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	2200	7,2-7,6	mm		
1.2 Supply-pump pressure	2200	6,4-7,2	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	2000	26,5-27,5	cm <sup>3</sup> /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure			cm³/1000 stroķes		
1.4 Idla regulation	365	12,0-16,0	cm³/1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.40,0	cm <sup>3</sup> /1000 strokes		
1.6 Start	2450	9,0-15,0	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing					

2. Test Spe	cifications	checking values in brackets (	)	· · · · · · · · · · · · · · · · · · ·
2.1 Timing device	n = rev/min mm	800 1,1-2,1(0,9-2,1)	1600 4,6-5,2(4,2-5,6)	2200 (6,7-8,1)
2.2 Supply pump	n = rev/min bar (kgf/cm²)	400 1,9-2,7		
Overflow delivery	n = rev/min cm³/10 s	500 55-111 (40-126)		2300 55-111(40-126)
2.3 Fuel deliveries				3 Dimensions

2.3 Fuel deliveries				
Spaed control lever	Rot. speed rev/min	Fuel delivery   cm <sup>3</sup> /1000 strokes		Charge-air press.
End stop	2550 2450 2250 2000 1250 600	max.6,0 25,5-27,5 25,8-28,2 20,0-23,0	(8,0-16,0) (24,2-28,8) (24,7-29,3) (24,7-29,3) (18,5-24,5)	
switch-off	2300	0		
Idle stop  End stop	400 365 450-550	max. 6,0	(10,0-18,0)	
2.4 Solenoid	cut-in voltag	ı.	<u>0</u> V Itage 12 V	

	Designation	for assembly and adjustment mm		
,	K KF MS SVS XK XL A B	3,2-3,4 5,7-5,9 1,7-1,9 max.3,0 19,5-21,5 10,9-14,7		
	Observations Clearance b position an increased i 0.5-1.0 mm			

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung © 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgarf 1. Printed in the Federal Republic of Germany. Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH

# **Test Specifications** Distributor-type Fuel-injection Pumps

WPP 001/4 VWW 1,6 b

2. Edition

VE 4/9 F 2400 R 66-2 0 460 494 050

Overflow temperature 45° C

supersedes

5.82 VWW

company: engine:

Rabbit

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting mm see VDT-W-460/...

1. Settings	Rat. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	1500	2,0-2,4	mm		
1.2 Supply-pump pressure	1500	5,0-5,6	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1500	30,0-31,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure			cm³/1000 strokes		
1.4 Idle regulation	415	6,5-10,5	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.35,0	cm <sup>3</sup> /1000 strokes		
1.6 Start	2600	11,0-17,0	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing					

2. Test Spe	cifications	checking values in brackets (	)	
2.1 Timing device	n = rev/min mm	1500 (1,5-2,9)	2000 4,3-4,9(3,9-5,3)	2400 6,0-7,0(5,8-7,2)
2.2 Supply pump	n = rev/min bar (kgf/cm²)	400 1,1-1,7		2400 7,5-8,1
Overflow delivery	n = rev/min cm <sup>3</sup> /10 s	500 55-110(40-125)		2400 55-110(40-125)
O O Front deliveries	L	<u></u>	2 [	limaneione

	_L		
2.3 Fuel deliveries			
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2750 2600 2400 1500 600	2,0-10,0 (2,0 - 10,0) (10,0- 18,0) 25,9-28,5 (24,9- 29,5) (28,2- 32,8) 17,5-20,5 (16,0- 22,0)	
switch-off	2400	0	
Idle stop  End stop	1200 600 415 400 500	max.3,0 max.6,0 (4,5-12,5) min.14 max.20	
2.4 Solenoid	cut-in voltage	min.10,0 V	<u> </u>

3. Dimens	for assembly
Designation	and adjustment mm
к	3,2-3,4
KF	5,7-5,9
MS	1,3-1,5
svs	max.4,0
+FH	1,8-2,4
4XK	18,4-20,4
<sup>B</sup> XL	9,1-12,9
Observations	
+operatin (cold-st	g stroke art accel.)

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Féderale d'Allemagne par Robert Bosch GmbH.

# **Test Specifications** Distributor-type Fuel-injection Pumps

WPP 001/4 Sof 2,5b1 1. Edition

VE 4/9 F 2100 R 22-3

0 460 494 024

Overflow temperature 45° C

supersedes

company: engine:

Sofim 8140.6.1

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Pre-stroke setting

0,3

 $\pm 0.02 (0.04)$ 

Test Instructions and Test Equipment

see VDT-W-460/...

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	1800	7,4 - 7,8 mm		
1.2 Supply-pump pressure	1800	6,3 - 6,9 bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	2000	37,5 -38,5 cm <sup>3</sup> /1000 stroi	es	2,5(3,0)
Full-load delivery without charge-air pressure		cm <sup>3</sup> /1000 strol	ces	
1.4 Idle regulation	370	8,0-12,0 cm <sup>3/1000</sup> strol	ves	2,5(3,0)
1.5 Full-speed regulation	100	min.55,0 cm <sup>3/1000</sup> strol	ves	
1.6 Start	2350	19,0-25,0 cm <sup>3/1000 stroi</sup>	kes	
1.7 Load-dependent port-closing	1800			

2. Test Spe	cifications	checking values in brackets (	)	
2.1 Timing device	n = rev/min	400	1800	2100
	mm	1,8-2,8(1,6-3,0)	(6,9-8,3)	8,3-9,3(8,1-9,5)
2.2 Supply pump	n = rev/min	400		2100
	bar (kgf/cm²)	2,9-3,5		6,9-7,5
Overflow delivery	n = rev/min cm <sup>3</sup> /10 s	500 55-111(40-126)		2100 55-111 (40-126)
2.3 Fuel deliveries				3. Dimensions
Speed control lever	I Rot speed	t Fuel delivery	Charge-air press.	and adjustment Designation i mm

2.3 Fuel deliveries					3. Dime
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press. bar (kgf/cm²)	Designation
End stop	2500 2350 2100 2000 1100 600	43,5-46,5	(18,0-26,0) (35,3-40,3) (35,3-40,3) (42,7-47,3) (33,8-39,8)		K KF MS SVS *FH
switch-off	2100	0			A B
Idle stop	500 370	max.3,0	(6,0-14,0)		Observations  * open
2.4 Solenoid	cut-in vol		10 V age 12 V		

K KF MS SVS *FH	 5,4-5,6 1,7-1,9 max.2,7 1,8-2,4
 A B	
 Observations  * operati (cold-s	ng stroke tart accel.)

**BOSCH** 

46

WPP 001/4 PEU 2,3h3

1. Edition

VE 4/10 F 2075 R 40-2

0 460 404 008

Overflow temperature 45° C

supersedes

company: engine: Peugeot XD 2 S

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting

- mm

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	1400	5,0-5,4	mm	0,67	
1.2 Supply-pump pressure	1400	5,1-5,7	bar (kgf/cm²)	0,67	
1.2 Supply-partip pressure	500	35,0-36,0	cm <sup>3</sup> /1000 strokes	0	2,5(3,0)
charge-air pressure  Full-load delivery without	1000	47,3-49,7	cm <sup>3</sup> /1000 strokes	0,67	
cha:ge-air pressure  1.4 Idle regulation	425	8,0-12,0	cm <sup>3</sup> /1000 strokes	0	2,5(3,0)
1.5 Full-speed regulation	100	min.70,0	cm <sup>3</sup> /1000 strokes	0	
1.6 Start	2375	20,0-26,0	cm <sup>3</sup> /1000 strokes	0,67	
1.7 Load-dependent port-closing	1400				

2. Test Spe	cifications	checking values in brackets ( )		
2.1 Timing device	n = rev/min	750 1,0-1,8(0,7-2,1)	1400 (4,5-5,9)	2000 7,7-8,5(7,4-8,8)
2.2 Susaly numn	n = rev/min	400		2075
n = rev/min bar (kgf/cm²)	2,4-3,0		6,5-7,1	
		500		2075
O <del>verflow</del> delivery	n = rev/min cm³/10 s	55-110(40-125)		55-110(40-125)
			T	3 Dimensions

Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press bar (kgf/cm²)
End stop	2500 2375 2000 1750 1000 +700 500	47,3-49,7	(5,0-13,0) (19,0-27,0) (42,7,47,3) (45,5-50,1) (46,2-50,8) (39,0-45,0) (32,5-38,5)	0,67 0,67 0,67 0,67 0,67 0,25
switch-off	2075	0		
kde stop	460-590 425	0	(6,0-14,0)	0 0 0
2.4 Solenoid	cut-in voltag	111 411 4	.10 V	1

ISIONS for assembly and adjustment
mm
Maß Kl
5,7-5,9
1,0-1,2
max.4,0

\* LDA-stroke 3,5 mm. Use adjusting nut (46) to correct.

BOSCH

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 Vol 3,6L 1. Edition

<u>En</u>

VE 6/10 F 1800 L 93 0 460 406 011

Overflow temperature 45° C

supersedes company:

engine:

Volvo-Penta MD 40 "C"

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/...

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm³
1.1 Timing device travel	1500	3,5-3,9	mm		
1.2 Supply-pump pressure	1500	6,5-7,1	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1500	44,0-45,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure			cm³/1000 strokes		
1.4 Idle regulation	350	5,0-9,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.60,0	cm³/1000 strokes	4	
1.6 Start	1900	32,5-38,5	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing	ļ				

2. Test Spe	cifications	checking values in brackets (	)	
2.1 Timing device	n = rev/min mm	1000 1,1-1,9(0,8-2,2)	1500 (3,0-4,4)	1800 4,7-5,5(4,4-5,8)
2.2 Supply pump n = rev/min		600		1800
	bar (kgf/cm²)	3,2-3,8		7,5-8,1
Overflow delivery	n = rev/min	500		1800
	cm <sup>3</sup> /10 s	55-110(40-125)		55-110(40-125)
		<del></del>		

_			00 110(40 120)			
2.3 Fuel deliveries				3. Dimer	ISIONS for assembly and adjustment	
Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)	Designation	mm	
End stop	2210-2280 2000 1900 1800 1500 600	0 21,5-29,5 (21,5-29,5) (31,5-39,5) 41,5-44,5 (40,7-45,3) (42,2-46,8) 37,5-40,5 (36,0-42,0)		K KF MS SVS		
switch-off	1800	0		A B		
idle stop	380-450 350	0 (3,0-11,0)		Observations		
2.4 Solenoid	cut-in voltage	min.10 V rated voltage 12 V				

BOSCH

Geschaftsbereich KH. Kundendienst Kfz-Ausrustung 1980 by Robert Bosch GmbH, Postfach 50, D-7000 Stuttgart 1 Printed in the Federal Republic of Germany Imprime en République Federale d'Allemagne par Robert Bosch GmbH. **6** 

estoil-ISO 4113

# Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 BUK 1,5 A 1. Edition

n

VE 3/10 F 1800 L 33

0 460 403 001

Overflow temperature 45° C

supersedes

company: Bukh

engine:

DV 36 ME

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Pre-stroke setting

0,2

 $_{mm}$  ± 0,02(0,04)

Test Instructions and Test Equipment

see VDT-W-460/...

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	1600	5,0-5,4	mm		
1.2 Supply-pump pressure	1600	6,2-6,8	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1600	28,5-29,5	cm³/1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure			cm <sup>3</sup> /1000 stroķes		
1.4 Idle regulation	450	6,0-10,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 38,0	cm <sup>3</sup> /1000 strokes		
1.6 Start	1850	20,0-26,0	cm <sup>3</sup> /1000 strokes		:
1.7 Load-dependent port-closing					

2. Test Spe	cifications	checking values in brackets (	)		
2.1 Timing device	n = rev/min mm	1000 1,4-2,2(1,1-2,5)	1400 3,8-4,4(3,4-4,8)	1600 (4,5-5,9)	
2.2 Supply pump	n = rev/min	400		1800	
	bar (kgf/cm²)	2,4-3,0		6,7-7,3)	
Overflow delivery	n = rev/min	500		1800	
	cm <sup>3</sup> /10 s	55-110(40-125)		55-110(40-125)	

	cm <sup>3</sup> /10 s	55-110(40-	-125)			10(40-125)
2.3 Fuel deliveries					3. Dimer	1Sions for assembly
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes		Charge-air press. bar (kgf/cm²)	Designation	and adjustment mm
End stop	1930-2000 1900 1850 1800 1600 1000	29,5-30,5	(19,0-27,0) (27,2-31,8) (27,2-30,8) (27,7-32,3) (18,0-24,0)		K KF MS SVS	5,9-6,1 1,2-1,4 max.6,0
switch-off electr. mech.	1800	0			A B	3,5-6,7
idle stop	500-570 450	0	(4,0-12,0)		Observations	
2.4 Solenoid	cut-in voltage	min.				

**BOSCH** 

B6

# Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 FIA 1,7 d
1. Edition

VE 3/10 F 1950 R 46-1

0 460 403 005

Pre-stroke setting

Overflow temperature 45° C

supersedes

company:

Fiat

engine:

8130.61.200

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

mm

Test Instructions and Test Equipment

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm²
1.1 Timing device travel	1500	4,0-4,4	mm		
1.2 Supply-pump pressure	1500	5,4-6,0	bar (kgf/cm²)		
1.3 Full-load delivery with charge-air pressure	1500	39,5-40,5	cm <sup>3</sup> /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure			cm <sup>3</sup> /1000 stroķes		
1.4 Idle regulation	350	8,0-12,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 40,0	cm <sup>3</sup> /1000 strokes		
1.6 Start	2200	7,0-13,0	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing	1500				

2. Test Spe	ecifications	checking values in brackets (	)	
2.1 Timing device	n = rev/min	1000	1500	1800
	mm	1,7-2,5(1,4-2,8)	(3,5-4,9)	5,0-5,6(4,6-6,0)
2.2 Supply pump	n = rev/min	600		1950
	bar (kgf/cm²)	2,3-2,9		7,0-7,6
Overflow delivery	n = rev/min	500		1950
	cm <sup>3</sup> /10 s	55-110(40-125)		55-110(40-125)
			T I	0.00

	i	1	
2.3 Fuel deliveries			
Speed control lever	Rot. speed rev/min	Fuel delivery cm <sup>3</sup> /1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2300 2200 1950 1500 600	max.5,0 (6,0-14,0) 37,0-39,0 (35,7-40,3) (47,7-42,3) 30,5-33,5 (29,0-35,0)	
switch-off	1950	0	
idle stop	400-500 350	0 (6,0-14,0)	
Endanschlag	400 500	min.34,0 max.35,0	
2.4 Solenoid	cut-in voltage	min. 10 V rated voltage 12 V	

3. Dimens	
Designation	for assembly and adjustment mm
к	
KF	5,9-6,1
MS	1,4-1,6
svs	max.2,8
* K	
B XL	
Observations	<u> </u>
Electric st	top control

a 300 min/1. Residual quantity max 2.5 mm<sup>3</sup>/

stroke

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung.

1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fedérale d'Allemagne par Robert Bosch GmbH.

40

WPP 001/4 BOS 12,3 1

1. Edition

En

PE 6 P 120 A 821 LS253

RQ 250/1150 PA209R

supersedes

company: engine: MAN-Büssing D 3256 BYUL 176kW (240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,80-2,90 (2,75-2,95

mm (from BDC)

Cy1.6

Rotational speed	Control rod travel	Fuel delivery  cm <sup>3</sup> /100 strokes	Difference cm³/ 100 strokes	Control rod travel	Fuel delivery cm <sup>3</sup> /100 strokes	Spring pre-tensioning (torque-control valve)
1	2	3	4	2	3	6
1150	10,0	17,9 - 18,2	0,4(0,8)			
250 500	+ 0,1 7,4-7,6 	4,6 - 5,2 C, 4 - 5	0,4(0,7) 0,6(1,0)	1		
•						

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Į	Checking of slider Full-load speed				gulation		Idle speed regulation				Torque control		
	PRG che	ck (1)	Setting po	int	Test spec	cifications (4)	Setting p	point	Test spe	cifications (5)		(	(3)
	rev/min	Control rod travel mm	rev/min 3	Control rod travel mm 4	Control rod travel rnm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm	
	1500	15,6-16,4	500	16,0	9,0	1195-1210	250	4,0	100 250	min.7,0 3,9-4,1	-	-	
	1150	15,6-16,0			4,0	1230-1260		1	280- 400	320 =2,0 0 - 1			
	1360	0 - 1							7.00				

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

	elivery on ontrol lever np. 40°C (104°F)	Control rod stop 3	Fuel deliv	· /01 \	Starting for	uel delivery d (Control
rev/min	cm <sup>3</sup> /-1000 strokes 2	rev/min 3	rev/min	cm <sup>3</sup> /~1000 strokes 5	rev/min 6	rod travel cm <sup>3</sup> /1000 strokes:/ mm 7
1150	179,5 - 181,5 (176,5 - 184,5)	1150	500	123,0 - 128,0 (120,0 - 131,0)	100	280,0 - 300,0

Checking values in brackets

## Test Specifications Fuel Injection Pumps 2 and Governors

WPP 001/4 BOS 12,3 1 2. Edition

PE 6 P 120 A 821 LS263

RQ 250/1150 PA209R

supersedes

HAM-Büssing company:

**D 3256 RYUL** engine:

176 kW (240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,75-2,95)

mm (from BDC)

Cy1.6

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	10,0	17,9 - 18,2	0,4(0,8)			
250 500 -	+0,1 7,4-7,6 	4,6 - 5,2 C, 4 - 5	0,4(0,7)	ř		

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

PRG che	Control rod travel	Full-load s Setting po rev/min 3	•	_	cifications (4) rev/min 6	idle spee Setting p rev/min 7	Control rod travel mm	Test spe	cifications 5 Control rod travel mm	Torque o rev/min 11	Control rod (3)
500 1360	15,6-16,4 0 - 1	500	16,0	9,0 4,0	1195-1210 1230-1260	250	4,0	100 250 280- 400	min.7,0 3,9-4,1 320=2,0 0 - 1	-	-

**Torque-control travel** on flyweight assembly dimension a =

Speed regulation: At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

	elivery on control lever np. 40°C (104°F)	Control rod stop	Fuel deliv	ery characteristics	Starting f	uel delivery d I Contre
rev/min 1	cm <sup>3</sup> /-1000 strokes	rev/min 3	rev/min 4	cm <sup>3</sup> /~1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes:// mm
1150	179,5-181,5 (176,5-184,5	1195-1210*	500	123,0-128,0 (120,0-131,0)	100	280,0-300,0

Checking values in brackets

11.80

BOSCH

①

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4

MAN 11,1 o 1

2. Edition

**Festoil-ISO 4113** 

PES 6 P 110 A 720 LS295

ROV 250-1100 PA334R

supersedes 3.78

company: M A N

engine: D 2566 MTE

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15) mm (from BDC

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery  cm³/100 strokes	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,0	15, 1 - 15, 3	0,4(0,8)			
250	+0,1 7,9-8,1	1,6- 2,2	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

deflection	rev/min Control	Control rod (a)	Intermediate Degree of deffection	rated sp	ced Control rod travel	Lower rated Degree of deflection	speed	Control rod	Sliding s	leeve travei
of control lever 1	rod travel mm 2	mm rev/min (2a) 3	of control lever	rev/min 5	mm 4 6	of control lever 7	rev/min 8	mm 3 9	rev/miກ 10	mm 11
ca.55	1100 1300	15,2-17,8 0 - 1	-	-	-	ca.13		min9,5 7,9-8,1	200	0,2-0,8
ca.50	12,0	1140-1150					380 <b>-</b> 450	420 =2,0 0 - 1	1100	8,6
	4,0	1215-1245				<b>3a</b>			-	~

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-rod Test oil ten		limitation intermediate speed	high idle s	very characteristics 5a	Starting Idle switchir		Torque- travel	control (5)
rev/min	cm³/1000 strokes .	rav/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1100	151, 0- 153, 0 (148, 0- 156, 0)	1140-1150*			100	215,0-235,0		
					100-	170 (80-190)		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

9.78

BOSCH

TEX/Pu

Geschäftsbereich KM. Kundendienst. Kfz-Austustung c. by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 9,6 d 1. Edition

PE 6 P 100 A 320 LS805

RQV 350-1250 PA251R

supersedes

 $6 - 3 - 5 - 2 - 4 - 1 \pm 0,5 (\pm 0,75)$ 

company: Daimler-Benz

0 -45 -120-165-240-285°

OM 401 engine:

(192 PS)

\*\* Set at the reduced-delivery stop.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings 3,40-3,50

Cv1 6

stroke	(3.35-3.45)	mm (from BDC)		Cy 1.0	
Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
10,4	10,3 - 10,5	0,3(0,6)			
(+0,1)					
7,8-8,0	2,3 - 2,8	0,4(0,7)			
_	C, 4 - 5 -	0,4(0,7)			
	Control rod travel mm 2 10,4 (+0,1) 7,8-8,0	Control rod travel  mm cm³/100 strokes 2 10,4 10,3 - 10,5  (+0,1) 7,8-8,0 2,3 - 2,8	Control rod travel  mm cm³/100 strokes 2  10,4  10,3 - 10,5  (+0,1)  7,8-8,0  2,3 - 2,8  Difference cm³/ 100 strokes 4  0,3(0,6)	Control rod travel  mm	Control rod travel  mm

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

Upper rated s	speed		Intermediate	rated sp	eed	Lower rated	speed		Stidings	leeve travel
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min 28	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	1250 1500	15,2-17,8 0 - 1	-	-	-	ca.17	150 350		300 1285	0,4-1,6 8,3
ca.68	9,4	1280-1290					700-7 900	760 = 2.0 0 - 1	-	-
	4,0	1345-1375			e e e e e e e e e e e e e e e e e e e	<b>3a</b>				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roe Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel delic high idle s		Starting Idle switchin	. )	Torque- travel	control 5
rev/min	cm <sup>3</sup> /1000 strokes	rev/min (4a)			rev/min cm³/1000 strokes		rev/min	travel mm
<u> </u>	2	3	4	5	6	7	8	9
1230	103,0-105,0	1280-1290*	1230	77,0-79,0** (75,0-81,0)	100	110,0-130,0		l
		ď	1360 spers	4,1-4,3mmRW ion max. 4	350	24,0- 29,0		<u> </u>
					100	-270(80-290)		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

8.77

Geschäftsbereich KH. Kundendienst. Kfz-Ausrustung.

© by Robert Bosch GmbH. D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany Imprime en République Féderale d'Allemagne par Robert Bosch GmbH.

# **Test Specifications** Fuel Injection Pumps 1 and Governors

VDT-WPP 001/4 MB 16,0e 1. Edition

PE 10 P 100 A 320 LS821

RQV 350-1100 PA 319 DR

supersades company:

Daimler-Benz

Cam sequence and angular cam spring

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10 0 -45 - 72-117-144-189-216-261-288-333-360°

OM 403 engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,4+0,1

mm (from BDC)

(+0,5]

Cv1. 10

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7 - 12,4	0,4			
600 600	9 15	5,0 - 6,2 15,3 - 17,0				
200	9	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated s	Peed		Intermediate	rated sp	eed	Lower rated	speed	•	Sliding	leeve travel
deflection of control	rev/min Control rod travel	Control rod travel	Degree of deflection of control lever		Control rod travel	Degree of deflection of control		Control rod travel		<sub>l</sub> ①
lever 1	mm 2	rev/min (2a 3	4	rev/min 5	mm (4) 6	lever 7	rev/min 8	mm (3)	rev/min 10	11
ca.68	1140 1180 1240 1320	15,0-18,0 7,8-13,0 0 - 7,7 0		-	<b>-</b>	ca.15	200 350 550 830	8,4-10,3 5,7- 7,8 3,0- 4,7 0	500 1140 1080	8,3

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		intermediate speed	Fuel deliv	very characteristics 5a speed 5b	Starting Idle switchir		Torque- travel	control 5
rev/min	cm³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	12	3	4	5	6	7	8	9
1080	85,0-87,0 (83,0-89,0)	1150-1165*	900	82,0-85,0 (80,0-87,0)	100	110,0-130,0		
	(30,5 65,67		700	(80,0-87,0) 77,0-80,0 (75,0-82,0	disp <b>Chan</b>	-1265,4mmRW ersion max. 6 ge-over point 250 min-1		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

①

Festoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 9,6 m 1
1. Edition

\_En

PES 5 P 100 A 820 LS 416 RQV 300-1100 PA 594

1 - 3 - 5 - 4 - 2 je  $72^{\circ} \pm 0.5^{\circ} (\pm 0.75^{\circ})$ 

supersedes

Daimler-Benz

company: OM engine: 14

OM 409 141,0 kW(192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,00=3,10 /2 95=3 15\

mm (from BDC)

Cy1. 5

		(2,33-3,13)				
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,8+0,1	12,2-12,4	0,3(0,6)			
300 1200	7,0-7,2 3,0-3,2	1,0-1.6 C, col.6,7	0,3(0,5) 0,4(0,6)			·

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated s	speed			Intermediate	rated sp	eed	Lower rated	speed		Sliding sleeve travel	
Degrae of deflection of control lever	rev/min Control rod travel mm	mm .	(%)	Degree of deffection of control lever	rev/min	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel mm 3	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
ca.49		15,2-17,8 1140-1150		-	-	=		300	7,1		
		1175-1205						100 300	min.8,5 7,0-7,2		
							330-390				
							<b>3a</b>	320-	433		

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roe Test oil ten		intermediate speed				fuel delivery 6	Torque- travel	Control rod
rev/min	cm³/1000 strokes	rev/min (4a)	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1100	122,0-124,0 (120,0-126,0)	1140-1150*			100	130,0-150,0	-	-
					1200	11,0- 19,0		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

BOSCH

Geschäftsbereich KM. Kundendienst. Kfz-Ausrustung.

© by Robert Bosch GmbH. D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany Imprime en République Féderale d'Allemagne par Robert Bosch GmbH.

# Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MAN 11,103

1. Edition

Testoil-ISO 4113

PES 6 P 110 A 720 LS 295

RQV 750 PA 377 R RQV 750 PA 343 R supersedes compan MAN engine: D 2566 MTE

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Rotational speed	Control rod travel	Fuel delivery	Difference cm <sup>3</sup> /	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min 1	mm 2	cm <sup>3</sup> /100 strokes 3	100 strokes	mm 2	cm <sup>3</sup> /100 strokes 3	mm 6
725	12,6+0,	15,2 - 15,4	0,4(0,8)			
250	7,8-8,0	2,8 - 3,4	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

.. PA 377 R, .. PA 343 R

Upper rated s	peed			Intermediate	rated sp	eed		Lower rated	speed			Sliding sleeve travel	
deflection of control	rev/min Control rod travel	Control rod travel mm	(a)	Degree of deflection of control		Control ro- travel		Degree of deflection of control		Contro travel			1
lever	mm	rev/min	(2B)	lever		mm	(A)	lever	rev/min	mm	(3)	rev/min	mm
<del>-</del>	2	3		4	5	6		7	8	9		10	11
ca.29	11,6 4,0	745-755 765-785		-	<b>-</b>	-		-	-		-	•	-
								<b>3</b> a)					

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ter		Rotational-speed 2b limitation intermediate speed	Fuel deliv	rery characteristics 5a	Starting Idle switchir	• •	Torque- travel	control 5
rev/min 1	cm³/1000 strokes	rev/min 4a 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes	rev/min 8	travel mm
725	152,0-154,0 (149,0-157,0)		-	-	100	12,6 - 12,7 mm RW	•	-

Checking values in brackets

\* i mm less control rod travel than col. 2

5.81

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung. € by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany. Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

# **Test Specifications** Fuel Injection Pumps 2 and Governors

WPP 001/4 MB 9.6 m 2. Edition

PES 5 P 100 A 820 LS 416

RQ 300/1100 PA 327R

supersedes

3.81

1 - 3 - 5 - 4 - 2

engine:

company:

Daimler-Benz

 $0 - 72 - 144 - 216 - 288 \pm 0,5(\pm 0,75^{\circ})$ 

OM 409

141 kW(192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(2,95-3,15)

m (rom BDC) RW 10.5

Rotational speed rev/min 1	Control rod travel • mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,6	12,2 - 12,4	0,2(0,25)			
300	+ 0,1 8,3-8,5	1,0 - 1,6	0,2(0,25)			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

PRG che	ck Control rod travel		•	•	cifications (4) rev/min 6	Idle spec Setting p rev/min 7	Control rod travel		cifications 5 Control rod travel mm	rev/min	Control rod travel	9
600	13,8-14,6	600	14,2	12,6	1140-1155	300	8,4	100	min.10,0			
1300	0 - 1			4,0	1175-1205			300 375-	8,3-8,5 415 =2,0			

Torque-control travel on flyweight assembly dimension a =

Speed regulation: At 1145-1160 min-1

1 mm less control

#### C. Settings for Fuel Injection Pump with Fitted Governor

	elivery on control lever np. 40°C (104°F)	Control rod stop	Fuel deliv	ery characteristics	Starting fuel delivery Idle speed		
rev/min	cm <sup>3</sup> /-1000 strokes	rev/min 3	rev/min	cm <sup>3</sup> /-1000 strokes	rev/min	rod travel cm <sup>3</sup> /1000 strokes / mm 7	
1100	122,0-124,0 (120,0-126,0)				100	130,0-150,0	

Checking values in brackets

# <sup>②</sup> Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 11,4 g 3. Edition

Ξn

PES 6 P 110 A 820 LS 422

Port closing at prestroke

RQ 300/1100 PA 327-2

supersedes

2.81

company:

Daimler-Benz

OM 407

engine:

176,5 kW(240PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

95-3,15) mm (from BDC)

Cy1.6

		3,00-3,10									
Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes	Control rod travel mm 2	Fuel delivery  cm³/100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6					
1100	11,7	13,0-13,2	0,2(0,25)								
300 600	+ 0,1 7,6-7,8 11,7+0,1	1,1 - 1,7 C, col.4-5	0,2(0,25) 0,6(1,0)								
	<u> </u>	<u> </u>		1		<b>,</b>					

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

Checkin PRG che rev/min 1	Control rod   travel	Full-load s Setting po rev/min 3	•	-	rev/min	Idle spec Setting p rev/min 7	Control red travel		cifications 5 Control rod travel mm	rev/min	Control rod travel mm	3
600	13,0-14,0	600	13,5		1145-1160 1180-1210	300		100 300 375- 4	min.10,0 7,6-7,8 115 =2,0			

Torque-control travel on flyweight assembly dimension a =

Speed regulation: At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

	lelivery on control lever pp. 40°C (104°F)	Control rod stop 3a	Fuel deliv	ery characteristics	Starting f	. •
rev/min 1	cm <sup>3</sup> /-1000 strokes 2	rev/min	rev/min 4	cm³/~1000 strokes	rev/min	Control rod travel cm <sup>3</sup> /1000 strokes:/ mm
1100	130,0-132,0 (127,0-135,0)		600	118,0-122,0 (115,0-125,0)	100	130,0-150,0
					300	13,0 - 19,0

Checking values in brackets

8.81

BOSCH

# Test Specifications Fuel Injection Pumps 2 and Governors

VDT-WPP 001/4 BOS 12,3k

1. Edition

PE 6 P 110 A 821 LS 253

RQ 250/1150 PA 209

supersedes

company:

engine:

Büssing U 12 D (256 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings 2,8 + 0,1

Port closing at prestroke

mm (from BDC)

+ 0.15 - 0.05

Rotational speed rev/min	travel		Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm
1000	12	13,1 - 13,9	0,5			
600 600 200	9 15 9	7,2 - 8,4 17,2 - 19,4 5,5 - 6,7				

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

Checkin PRG che rev/min 1	Control rod   travel	Full-load s Setting po rev/min 3	•	-	cifications (4) rev/min 6	Idle spec Setting p rev/min 7	Control red travel		cifications 5 Control rod travel mm		Control rod (3) travel mm
550	15,7-16,3	550	16,0	1170 1200 1230 1290	15,6-16,0 8 -14 0 - 9,5 0	470	0	100 200 300 370	6,1-8,1 4,3-6,3 0,8-3,2 0	-	-

Torque-control travel on flyweight assembly dimension a =

Speed regulation: At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

	elivery on ontrol lever np. 40°C (104°F)	Control rod stop 3a	Fuel delivery characteristics		Starting Idle spe		fuel delivery 6	
rev/min	cm <sup>3</sup> /-1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /-1000 strokes 5		rev/min 6	cm <sup>3</sup> /1000 strokes:/ mm 7	
40° 1150	139,0-141,0 (137,0-143,0)	1170				100	24,0 - 26,0	

Checking values in brackets

# **Test Specifications** Fuel Injection Pumps (A) and Governors

WPP 001/4 MWM 53,1 b 1. Edition

(1) PE 8 P 120 A 500/5 LS 243 supersedes Südbremse (2) PE 8 P 120 A 520/5 LS 250 RSUV 300-750 P 9 A 332/1 R company D/TD/TBD 602V 16 (3) PE 8 P 120 A 500/5 LS 306 engine 602V 16 S 1-6-8-2-4-7-3-5 (1) 1-6-2-8-4-7-3-5 0-45-90-90-135-180-225-315°±0,5° 0-45-90-180-225-270-315°±0,5° (±0,75° All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers Komb.-Nr. 0 401 818 015 (1)

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,25-2,45)

mm (from BDC)

RW = 21,0 mm

0 401 878 075 (2) 0 401 818 017 (3)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm (2)	cm³/100 strokes	100 strokes	mm	cm³/100 strokes	mm
700	13,0+0,1	26,6-27,0	0,5	2	3	6
		(26,3-27,3)	(0,9)			
300	5,5-5,7	2,8 - 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Degree of deflection of control lever	r rated speed Control rod travel mm	rev/min   Control rod   travel   mm rev/min   3	Interme	diate rate	speed	Control- lever deflection in degrees 7	Lower rev/min 8	rated speed  Control rod  travel  mm	3 To	Control rod travel
loose	800	0,3-1,0	-	-	•	ca.29	300	5,1	700 325	13,0+0,1
ca.70	12,0 4,0 980	790-800 815-845 0,3-1,7					100 300 315-375	5,5-5,7 = 2,0mm	450	14,2+0,6 13,0+0,1

The numbers denote the sequence of the tests

without (1), (3) and

#### C. Settings for Fuel Injection Pump with Fitted Governor

(2)

S S	emp 40°C (104°F)	Rotational- speed limitat	ILJEI	uel delivery naracteristics	Starting t	fuel delivery 5	<b>4a</b> ) Id	e stop
rev/min 1	cm³/1000 strokes	changed to ) rev/min	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>4</sup> 1000 strokes	rev/min	Control rod travel mm
The inspe	full-load delivection sheet. F	very is adjus vumps (1) and	ted or	the engine in	accord perate	ance with in tandem	the er	gine
		<b>9</b>						

Checking values in brackets

\* 1 mm less control rod travel than col 2

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH.

### **Test Specifications** Fuel Injection Pumps (A) and Governors

WPP 001/4 MWM 33,2 e 1 1. Edition

PE 6 P 130 A 320 LS 3025 RSUV 300-750 P 9 A 332/1 R

supersedes

Südbremse

1 - 6 - 2 - 4 - 3 - 5

company engine

 $0 - 15 - 120 - 135 - 240 - 255^{\circ} \pm 0,5^{\circ} (\pm 0,75^{\circ})$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

Festoil-ISO 4113

(2,75-2,95)

mm (from BDC)

RW = 21.0 mm

onal Control rod Fuel delivery travel		Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)		
mm 2	cm <sup>3</sup> /100 strokes 3	cm <sup>3</sup> / 100 strokes 4	mm 2	cm <sup>9</sup> /100 strokes	mm 6		
12,0+0,1	33,8-34,2	0,5					
	(33,5-34,5)	(0,9)					
4,8-5,0	2,1 - 2,7	0,8(1,2)					
	travei mm 2 12,0+0,1	travel mm 2 cm³/100 strokes 3 12,0+0,1 33,8-34,2 (33,5-34,5)	travel mm 2 cm³/100 strokes 12,0+0,1 33,8-34,2 0,5 (33,5-34,5) (0,9)	travel mm 2 cm³/100 strokes 3 cm³/100 strokes 4 cm³/ 12,0+0,1 33,8-34,2 0,5 (33,5-34,5) (0,9)	travel mm 2 cm³/100 strokes 3 cm³/ 100 strokes 4 cm³/100 strokes 3		

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Uppe Degree of	r rated speed Control rod	Control rod	Interme	diate rated	speed	4 Control	Lower	rated speed	1 4	Torque control		
deflection of control lever	mm	mm rev/min				lever deflection in degrees	rev/min	travel mm	rev/min	travel mm		
ļ	4	3	4	5	6	7	8	9	10	11		
loose	800	0,3 - 1,0	-	-	-	ca.28	300	4,4	750	12,0+0,1		
	X =	5,25					300	4,8-5,0	325 400	13,2+0,6 12,0+0,1		
ca.66	11,0 4,0 900	790-800 820-850 0,3-1,7					310-	370 = 2,0	mm			

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

_											
<b>S</b>	ull-load stop emp 40°C (104°F)	Rotational- speed limitat		iel delivery paracteristics	Starting I	fuel delivery 5	<b>4a</b> ) idi	e stop			
rev/min 1	cm <sup>3</sup> /1000 strokes	changed to ) rev/min 3	rev/min 4	cm <sup>2</sup> /1000 strokes 5	rev/min	cm#1000 strokes	rev/min 8	Control ro travel mm			
The insp	full-load deli ection sheet.	ivery is adjus	ted o	the engine in	accord	ance with	the en	gine			

Checking values in brackets

\* 1 mm less control rod travel than col 2 1.82

BOSCH

Geschaftsbereich KH. Kundendienst. Ktz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH.

### **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 11.0 i 2. Edition

PE 6 P 110 A 320 LS 3805

RQV 300-1150 PA 524-1

supersedes

4.81

company:

Daimler-Benz

engine:

OM 421

158 kW (215 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BOC)

RW 10,5

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,6+0,1	13,4-13,6	0,4(0,8)			
300	7,7-7,9	1,0 - 1,6	0,4(0,7)		·	

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

Upper rated s	peed			Intermediate	rated sp	eed	Lower rated	speed	•	Stiding	leeve travel
Degree of deflection of control	rev/min Control rod travel	Centrol rod travel	<b>(a)</b>	Degree of deflection of control		Control rod travel	Degree of deflection of control		Control rod travel		
lever	mm ave	rev/min	(2a)	lever	rev/min	mm (4)	lever	rev/min	mm 3	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
max.	1150	15,2-17	,8				ca.19		min.10 8,3-8,5	300 460	2,6 3,1-3,4
ca.65		1190-12 1240-12 0 - 1					330-730 39		740= 2,0	1200	8,4

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roc Test oil ten		Rotational-speed 2b limitation intermediate speed			Starting tdle switching		Torque- travel	control 5
rev/min	cm³/1000 strokes	rev/min 48	rev/min cm³/1000 strokes		rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1150	134,0-136,0 (131,0-139,0)	1190-1200*	600	123,0-127,0 (120,0-130,0)		140,0-160,0		
					220-	-100(80-240)		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

### **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 18.3 b

3. Edition

PE 10 P 110 A 320 LS 3808

RQV 300-1150 PA 524-2

supersedes

5.81

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2

0 -45 - 72-117-144-189-216-261-288-333  $\pm$  0,50°( $\pm$ 0,75°) -

Daimler Benz company: OM 423

engine:

259 kW (352 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings
(3,95-4,15)
Port closing at prestroke
4,00-4,10

mm (from BDC)

Cyl. 10

Rotational speed rev/min	Control rod travel	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,2	12,3 - 12,5	0,4(0,8)			
300	8,0-8,2	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated s Degree of deflection	rev/min	Control rod (a)	Intermediate Degree of deflection	Degree of Control ∉od			speed	Control rod	Sliding sleeve travel	
of control lever	rod travel mm 2		of control lever 4	rev/min 5	mm 4	deflection of control lever 7	rev/min 8	mm 3	rev/min 10	mm 11
ca.68	1150 1300	15,2-17,8 0 - 0,5		-	-	ca.18	100 300	min.10,1 8,0-8,2	550 850	1,0-1,2 3,4-3,7 4,9-5,3
ca.66	11,2 4,0	1190-1200 1245-1275				330 <b>-</b> 465 ③			1150	7,7

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel deliv	rery characteristics 58	Starting Idle switching		Torque- travel	Control rod	
rev/min	cm³/1000 strokes .	rev/min 48	rev/min cm³/1000 stro		rev/min cm³/1000 strokes		rev/min	travel mm	
1	3	3	4	5	6	7	8	9	
1150	123,0-125,0 (120,0-128,0		600	115,0-119,0 (112,0-122,0		130,0-150,0			

Checking values in brackets

\* 1 mm less control rod travel than col. 2

### **Test Specifications** Fuel Injection Pumps 1 and Governors



WPP 001/4 MB 12,8 b 1

1. Edition

PE 8 P 100 A 320 LS 810Z

ROV 300-1250 PA227R

-supersedes 1.78

8 - 7- 2 - 6 - 3 - 5 - 4 - 1 0 -45-90 -135-180-225-270-315° (± 0,50) ± 0,75)

Daimler-Benz company:

OM 402 engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings 3,40-3,50 Port closing at prestroke (3,35-3,55) mm

mm (from BDC)

Cy1. 8

		(3,39-3,99)				
Rotational speed rev/min t	Control red travel mm	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7-12,4	0,4			
600 600 200	9 15 9	5,0- 6,2 15,3-17,0 3,5- 4,5				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated s	peed		Intermediate	rated sp	eed	Lower rated	speed	1	Sliding s	leeve travel
deflection	rev/min Control	Centrol rod (1	- Laning cupu		Control rod travel	Degree of deflection		Control rod travel		. ①
	rod travel	mm rev/min (2	of control	rev/min	mm ④	of control lever	rev/min	mm ③	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	1230 1300 1340 1410	16,0-19,2 6,0-12,4 0 - 9 0		_	-	ca.12	150 300 450 680	7,2-8,1 4,6-6,7 1,5-2,9 0	300 800 1250	0,4-1,5 4,4-4,8 8,2
						<b>3a</b>				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ten		Rotational-speed 20 limitation intermediate speed	Fuel delivingh idle s	rery characteristics 5s peed 5b	Starting Idle switching	<u> </u>	Torque- travel	control 5
rev/min	crh³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	
"7"	2	3	4	5	6	7	8	9
1250	88,0-90,0	1290-1310*	600	66,5-71,5				
	P.							
					180	-250 (160-270	)	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 17.4 c

2. Edition

PE 10 P 100 A 320 LS 847 RQV 350-1150 PA 378 R

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 0 -45 -72 -117-144-189-216-261-288-333  $\pm 0.5^{\circ}$  ( $\pm 0.75^{\circ}$ )

4.81 supersedes

Daimler Benz company:

OM 403 engine:

259 kW (352PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel injection Pump Settings

RW 10,5

Port closing at pres		3.40-3.50	mm (from BDC)			
Rotational speed	Control rod travel	Fuel delivery  cm³/100 strokes	Difference cm <sup>3</sup> / 100 strokes	Control rod	Fuel delivery cm <sup>3</sup> /100 strokes	Spring pre-tensioning (torque-control valve)
1	2	3	4	2	3	6
1130	12,6	11,5 - 11,7	0,3(0,6)			
	+ 0,1					
350	8,3-8,4	1,2 - 1,8	0,3(0,5)			
į						

Adjust the fuel delivery from each outlet according to the values in p

#### **B.** Governor Settings

Upper rated s	speed		Intermediate	rated sp	eed	Lower rated	speed		Sliding	leeve travel
deflection		Control rod ta	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel	Silding s	1 1
	rod travel mm	rev/min (2a)	of control lever	rev/min	mm (4)	of control lever	rev/min	mm (3)	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	1130 1400	15,2-17,8 0 - 1,0				ca.12	100 300	min.7,5 6,0-6,2		
ca.62	11,6 4,0	1170-1180 1285-1310				375-490				
						<b>3</b> a				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel delivery characteristics 5a high idle speed 5b		Starting Idle switchir		Torque- travei	control 5	
rev/min	cm³/1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travei mm	
1	2	3	4	5	6	7	8	9	
1130	115,0-117,0 (113,0-119,0				100	130,0-150,0			
					100-	 220(80-240)			

Checking values in brackets

\* 1 mm less control rod travel than col. 2

1

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 1. Edition

PE 6 P 120 A 320 RS 391

RQV 225-1100 PA 458

supersedes

engine:

company:

Berliet L 12

1 - 5 - 3 - 6 - 2 - 4  $0 - 60 - 120 - 180 - 240 - 300 \pm 0,50 (0,75)$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings 3,40-3,50 mm (3,35-3,55) mm

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,2-10,3	17,3 - 17,5	0,4(0,8)			
225	6,0-6,2	1,6 - 2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

Upper rated a	speed	•		Intermediate	rated sp	eed	Lower rate	speed		Sliding sleeve travel	
deflection	rev/min Control rod travel mm	travei \		Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm (1)
1	2	3		4	5	6	7	8	9	10	11
ca.68	1100 1300	15,2-17,8 0 - 1	8	**	•	_	ca.25	100 225	min.7,7 6,0-6,2	225 490	1,4 3,8-4,1
ca.58		1140-1150 1180-1210						320-3	370=2,0	1150	8,3
							<b>3</b>				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil ter		Rotational-speed 2b limitation intermediate speed	Fuel delivery characteristics (5a) high idle speed (5b)		idle	fuel delivery 6	Torque- travel	control 5
rev/min	cm³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>2</sup> /1000 strokes	rev/min 8	travel mm
1100	173,0-175,0 (170,0-178,0				100 225 100-	120,0-155,0 16,0- 20,0		

Checking values in brackets

\* 1 mm less control rod travel than col. 2



# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MAN 20,9 q

MAN

D2542 ME

1. Edition

Testoi/-ISO 4113

PE 12 P 100 A 520/4 LS823 RQ 900 PA392R supersēdes

company:

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 0 -45 -60 -105-120-165-180-225 -240 -285-300-345

engine: (Nr.7898-228kW-310PS)

+0,50 (+0,75)All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,10-3,20 mm (from BDC)

Cv1. 12

	13	_05-3_25)	(		- <b>J</b> • • • • •	
Rotational speed rev/min 1		Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850 1	4,6-14,7	10,9 - 11,1	0,3(0,6)			
250 1	0,4-10,6	1,8- 2,4	0,3(0,5)			
	Į				!	1

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

deflection of control	rev/min	Control rod travel mm rev/min 3	(1a) (2a)	Intermediate Degree of deflection of control lever	rated spe rev/min 5	Control rcd travel	Lower rated Degree of deflection of control lever 7	speed rev/min 8	Control rod travel	Sliding s rev/min 10	leeve travel  mm  11
	1	900 <b>-</b> 905 930-940					<b>3</b> a				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ter		intermediate speed		Starting Idle switchin		Torque- travel	Control od	
rev/min	cm³/1000 strokes	rev/min 🐠	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	
1	2	3	4	5	6	7	8	9
850	109,0-111,0 (107,0-113,0)	900-905*						

Checking values in brackets

\* 1 mm less control rod travel than col. 2

①

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4

MAN 20,9i

1. Edition

E

\_

supersedes MAN

company:

engine:

D2542 MTE (343kW-466PS)

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 0 -45 -60 -105-120-165-180-225 -240 -285 -300-345° + 0,50 (+0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

PE 12 P 110 A 520 LS 839

Port closing at pres	stroke (	3,00-3,10 2-95-3-15)	mm (from BDC)	Су	1. 12	
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9-12,	0 14,2 - 14,4	0,4(0,8)			
250	<del>-</del>	1,1 - 1,7	0,4(0,7)			

RQV 250-1150 PA 353 R

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated	i i	1_	Intermediate	rated sp	<b>h</b>	Lower rated	speed		Sliding s	leeve travel
deflection	rev/min Control	Control rod (a)	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel		0
lever	rod travel	rev/min 2a	of control lever	rev/min	mm 4	of control lever	rev/min	mm ③	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.67	1150	15,2-17,8				ca.11	100	min.7,5	200	0,2-1,2
	1450	0 - 1,0					250	5,9-6,1	400	2,2-3,0
ca.66	10,9	1190-1200					470-5	30 = 2,0	1170	8,6
	4,0	1310-1340				<b>3a</b>				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed			Starting idle switchir		Torque- travel	control 5
rev/min	cm³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1150	142,0-144,0 (139,0-147,0)						1150 11,9	-12,0
					100-	170 (80-190)		·

Checking values in brackets

\* 1 mm less control rod travel than col. 2

10.79

BOSCH

Geschäftsbereich KM. Kundendienst. Kfz-Ausrüstung ⊊ by Robert Bosch GmbM. D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany Imprime en République Fédérale d'Allemagne par Robert Bosch GmbM.

WPP 001/4 FIA 13,8 n 2. Edition

PE 8 P 120 A 920/5 LS 3812

RQV 300-1200 PA 357R

supersedes 10.80

company: Fiat

engine: 8281.02.001

257 kW(350 PS)

0 -45 -90 -135-180-225-270-315

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	9,3-9,4	17,3-17,7	0,5(0,9)			
300	5,9-6,1	2,8- 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [

#### **B.** Governor Settings

Upper rated s	peed		Intermediate	intermediate rated speed			speed		Slidings	leeve travel
deflection of control	Control rod travel	Control rod travel	of control		Control rod travel	Degree of deflection of control		Control rod travel		0
lever 1	mm 2	rev/min 2a	lever	rev/min 5	mm (4)	lever 7	rev/min 8	mm (3)	rev/min 10	៣៣ 11
- 60	<del></del>	4.7.0.4.7.0		<del>                                     </del>		<u>'</u>	<u> </u>		10	
ca.68	1200	15,2-17,8			<u> </u>	ca.10	100	min.7,5		
	1450	0 - 1					300	5,9-6,1		
60		4040 4050				i	330-4	30 = 2,0		
ca.63	8,3 4,0	1240-1250 1305-1335								
	7,0	1303-1335				<b>3a</b>				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed			Starting idle switchin	, )	Torque-control (travel	
rev/min	cm <sup>3</sup> /1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strok <b>es</b>	rev/min	cm³/1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1200	173,0-177,0 (170,0-180,0	1240-1250* )			100	19,5-21,0 mm RW		
					300	28,0-36,0		
		,						

Checking values in brackets

\* 1 mm less control rod travel than col. 2

# **Test Specifications** Fuel Injection Pumps 1 and Governors

VDT-WPP 001/4 VOL 7,0  $\bar{c}$ 

2. Edition

PE 6 P 100 A 320 RS 269

RQV 250-1200 PA 231/2 R

supersedes company:

Volvo TD 70 D

Port-closing test with/without ROBO diaphragm See page 2!

engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

 $(^{+}_{-}0,15)$ 

Port closing at prestroke

3.0 + 0.1

mm (from BDC)

			mm (moni spo			
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,3 - 12,0	0,5			2,5 ± 0,1**
600	9 12	4,4 - 5,4				(max. 2,2-2,9)
	15	16,2 - 17,9				
200	9	2,8 - 3,8				

Adjust the fuel delivery from each outlet according to the values in

In the case of greater dispersion alter the delivery-valve spring pre-tension

# B. Governor Settings

Upper rated s	peed		Intermediate	rated sp	ed	Lower rated	speed	<del> </del>	Stidion	deeve trough
deflection	rev/min Control rod travel	Control rod travel	Degree of deflection of control		Control rod travel	Degree of deflection		Control rod travel	Siluing \$	leeve travel
lever	um		lever	rev/min	mm 4	of control lever	rev/min	mm (3)	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.50	1290 1560	15,0-18,4 0				ca.13	100	8,8-11,0		1,4-2,0
ca.45	1200 1300	15,0-18,2 8,2-13,3					200 300	7,1- 9,9 3,8- 6,8	1290	4,4-4,8 8,2
	1400	0 - 7,4					400 510	0 - 3,6 0		
	1510	0				<b>3a</b>				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Control-rod stop		Rotational-speed 2b limitation intermediate speed	Fuel deliv	rery characteristics 50 poed 50	Starting Idle switching		Torque- travel	control (5)
rev/min	cm <sup>3</sup> /1000 strokes .	rev/min 4	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travel mm
1	2	3	4	5	8	7	8	9
(1- 20 700	69) 83,0-85,0 (82,0-86,0)	1230-1240*			100	165,0-205,0		
	(32,6 33,6)			d <sup>.</sup>	225 spers		) ) **	
					,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

# **Test Specifications** Fuel Injection Pumps 1 and Governors

VDT-WPP 001/4 6. Edition

PE 6 P 120 A 320 RS 278

RQV 250-1100 PA 243 R

supersedes 7.74, 11.74

company: AEC

T.L. 12

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

3,4+0,1

mm (from BDC)

+0,15-0,05,

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 8
1000	12	19,7 - 20,3	0,5			
600	9	8,4 - 9,6				
600	15	18,6 - 20,4	j 			
200	9	3,3 - 4,3				

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

RQV ...243 R

Upper rated s	peed			Intermediate	rated sp	eed	Lower rated	speed	Cliding along to a			
deflection of control		Control rod travel mm rev/min 3	(a) (2a)	Degree of deflection of control lever	rev/min 5	Control rod travel	Degree of deflection of control lever 7	rev/min	Control rod travel mm 3	rev/min		
ca.61	1110 1150 1200 1260	15,0-18 8,2-13 0 - 7 0	,6	-	<u>-</u>	-	ca.25	80 150 250 330	7,0-11,0 5,1-8,6 1,1-4,8		5,2-3,6 4,9-5,3 8,3	
							<b>3a</b>					

Torque contro! travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roe Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel deli- high idle s	very characteristics 5a	ldle	fuel delivery 6	Torque- travel	control 5	
rev/min	cm³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min 6	cm <sup>3</sup> /1000 strokes	rev/min		
1100	229,0-231,0 (227,0-233,0)	1120			100	22,5-24,5	8	9	
					200	1,5 - 2,1			

Checking values in brackets

\* 1 mm less control rod travel then col. 2

①

Festoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 SCA 8,0 b 4. Edition

\_Er

PE 6 P 110 A 720 RS 261

RQV 250-1200 PA 215 R

supersedes

company:

Scania

engine:

D 8

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

3.0 + 0.1

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,0 - 9,7	0,4			
600	9	-				
600	15	14,0 - 15,8				
200	9	1,2 - 2,0				

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

	Upper rated a	peed		Intermediate	rated sp	eed	Lower rated	speed		Cliding	loovo trovol
	deflection	rev/min Control rod travel	Control rod travel	Degree of deflection of control		Control rod travel	Degree of deflection of control		Control rod travel	Siluing 8	leeve travel
			rev/min 2a	lever	rev/min	mm 4	lever	rev/min	mm ③	i .	mm
١			3	-	5	6	7	8	9	10	11
	ca.50	1220 1300 1400 1480	15,0-18,0 8,1-13,4 0 - 6,6 0	-	-	-	ca.13	100 200 300 470	8,6-11,0 7,2- 9,3 3,6- 7,0	400 600	0,2-1,2 1,8-2,4 3,7-4,2 6,0-6,4 8,3
							<b>3a</b>				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		Rotational-speed 20 limitation intermediate speed	Fuel deliv	rery characteristics 5a	Starting Idle switching		Torque- travel	control 5
rev/min	cm³/1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1200	88,5-91,5 (86,5-93,5)	1230	600	83,5-88,5 (81,5-90,5)	100	130 - 170		
			1300	38,0-43,0 (36,0-45,0)	225 disp	11 - 13 ) ersion max. 1	<b>,</b> 5	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

12,75

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung. € by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany Imprime en République Federale d'Allemagne par Robert Bosch GmbH.

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 19,1 g 1. Edition

PE 12 P 100 A 320 LS 831

RO 1150 PA310R

supersedes

company:

Daimler-Benz

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 0 - 45-60 -105-120-165-180-225-240-285-300-345°

± 0,5 (0.75)

engine:

OM 404

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel injection Pump Settings 3,20-3,30 mm (3,15-3,35) mm

mm (from BDC)

Cy1. 12

		3-13-3-337				
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	11,5	9,9 - 10,1	0,3(0,6)			
350	(+0,1) 7,4-7,6	0,5 - 1,1	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

deflection	rew/min Control rod travel	444.0	19	Intermediate Degree of deflection	rated sp	eed Control rod travel	Lower rated Degree of deflection	speed	Control rod travel	Sliding s	leeve travel
leve?		rev/min (		of control lever 4	rev/min 5	mm (4)	of control lever 7	rev/min 8	mm 3 9	rev/min 10	mrn 11
ca.33	10,5 4,7 1300	1150-116 1200-121 0 - 1		-	-	-	3a	-		1150	5,5

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ten	elivery d stop np. 40°C (104°F) 2	Rotational-speed 2b limitation intermediate speed	Fuel deliv	very characteristics 5a	Starting Idle switchir		Torque- travel	control 5 Control rod	
rev/min	cm <sup>3</sup> /1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min cm³/1000 strokes		travel mm	
1	2	3	4	5	6	7	88	9	
1130	99,0-101,0 (97,0-103,0)	1150-1160*			100	15 - 16			
i				dis	1205 persio				

Checking values in brackets

\* 1 mm less control rod travel than col. 2

WPP 001/4 MB 19,1 ; ]

1. Edition

PE 12 P 110 A 320 LS 830

RQ 1050 PA 374 R

supersedes

company: engine:

Daimler-Benz OM 404 A

(336 kW - 457 PS)

12 - 2 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 ±0,50 0 - 45 -60-105-120-165-180-225-240-285-300-345

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings 3,20-3,30

Cv1. 12

Rotational speed rev/min	Control rod travel mm 2	3.15-3.35) Fuel delivery cm <sup>3</sup> /100 strokes	Difference cm³/ 100 strokes	Control rod traval mrc. 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,9-13,0	14,0-14,2	0,4(0,8)			
300	7,3-7,5	1,1 - 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

deflection	rev/min Control	Control rod ta	Intermediate Degree of deflection	rated sp	Control rod travel	Lower rated Degree of deflection		Control rod	Sliding s	leeve travel
	rod travel mm 2	mm rev/min 2a 3	of control lever 4	rev/min 5	mm <b>4</b>	of control lever 7	rev/min 8	mm 3	rev/min	mm 11
	11,9	1055-1060								
	6,0	1095-1105				!				
	0-1	1200								
						<b>3</b>			,	

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-ros Test oil ten		Rotational-speed 2b limitation intermediate speed			Starting idle switching	• 0	Torque- travel	control 5
rev/min	cm³/1000 strokes .	rev/min 4	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
<u> </u>	2	3	4	5	6	7	8	9
1000	140,0-142,0 (137,0-145,0	)			100	110,0-130,0		
					,			

Checking values in brackets

\* 1 mm less control rod travel than col. 2

10.79

40

WPP 001/4 MWM 19,9 a
1. Edition

En

PE 6 P 110 A 300 RS 277

Komb.-Nr. 0 401 816 049

supersedes company

8.78 Südbremse

engine

D 601-6(Marine)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

**Testoil-ISO 4113** 

(1,95-2,15)

mm (from BDC)

RW 21,0 mm

Rotational speed	Control rod travel			Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve		
rev/min	mm (2)	cm³/100 strokes	cm <sup>S</sup> / 100 strokes	mm	cm <sup>9</sup> /100 strokes	mm		
1	2	3	4	2	3	6		
700	12,3+0,1	16,3-16,7	0,4					
300	7,0-7,2	(16,1-16,9) 2,7- 3,5	(0,8) 0,4(0,7)					
	}	<b>,</b>						

Adjust the fuel delivery from each outlet according to the values in

#### B. Governor Settings

Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	Interme	diate rated	speed	Control- tever deflection in degrees 7	Lower rev/min 8	rated speed  Control rod  travel  mm  9	rque control  Control rod  travel  mm
<b>2</b> a									

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

<b>2b</b> Fu	II-load stop	Rotational- speed limitat  Ga Fuel delivery characteristics			Starting fuel delivery 5 4a Idle stop			
1	emp. 40°C (104°F) cm <sup>3</sup> /1000 strokes	Note: changed to) rev/min	rev/min	cm³/1000 strokes	.	cm <sup>2</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
is ad engin with	ull-load delive justed on the e in accordance the engine ction sheet.				100	19,5-21,0		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

1.82

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung c. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

WPP 001/4 PEN 12,0 C 2. Edition

PE 6 P 120 A 320 RS 241

EP/RSV 200-900 P 4/421R

supersedes 3.78

company Volvo-Penta

TAMD 120 A engine

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,60-2,70 (2.55-2.75)

mm (from BDC)

Testoil-ISO 4113

	,-	,,,				
Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm <b>(2)</b>	cm³/100 strokes	cm³/ 100 strokes	mm	cm <sup>\$</sup> /100 strokes	mm
1	2	3	4	2	3	6
700	11,3	21,2-21,4	0,5(0,8)			2,5 ± 0,1** (max.2,2-2,9)
200	+0,1 6,0-6,1	1,6- 2,6	0,4(0,7)			(max.2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in the case of greater dispersion alter the delivery-valve spring pre-tension

## B. Governor Settings

(1) Uppe	er rated speed		Interme	diate rate	d speed	4	Lower	rated speed	(3) To	rque control
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min 3	4	5	6	Control- lever deflection in degrees 7	rev/min	Control rod travel mm 9	rev/min	Control rod travel mm
loose	800	0,3 - 1,0				ca.22	200	5,5		
	X =	5,0					100	min. 20		
ca.55	10,3 4,0 1010	940-950 966-996 0,3-1,7					200   255-315   400	6,0-6,1 = 2,0 0 - 1		

The numbers denote the sequence of the tests

### C. Settings for Fuel Injection Pump with Fitted Governor

	Pull-load stop St oil temp. 40°C (104°F)  Rotational- Speed limitat Note:			uel delivery paracteristics	Starting t	uel delivery 5	4a Idle stop	
rev/min	cm <sup>3</sup> /1000 strokes	note: changed to .) rev/min 3	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min .	cm#1000 strokes	rev/min	Control rod travel mm
700	212,0-214,0 (209,0-217,0)	940-950*			100 200 persion 981 persion	460 - 500 12 - 26)* max.4 3,9-4,1mmF max.6(9)		

Checking values in brackets

\* 1 mm less control rod travel than col 2

10.78

40

WPP 001/4 MB 11,4 k

1. Edition

\_En

PES 6 P 100 A 820 LS 430

RSV 350 - 1100 PO/485

supersedes

company engine Daimler-Benz OM 407 162 kW (220 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

3,0-3,1 (2,95-3,15)

mm (from BDC)

Cy1.6

Rotational speed	Control rod travel	fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm (2)	cm3/100 strokes	100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
1080	12,5+0,1	11,2-11,4	0,3(0,6)			
350	8,5-8,7	1,2-1,8	0,3(0,5)			
<u>.</u>		•				1

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

(1) Uppe	er rated speed		Interme	diate rated	i speed	4)	Lower	rated speed	(3) To	rque control
Degree of deflection of control lever	Control rod travel mm	Control rod   travel   mm rev/min   3	4	5	6	Control- lever deflection in degrees 7	rev/min	Control rod travel mm	rev/min	Control rod travel mm
loose	800	0,3-1,0	~	-	-	ca.28	350	8,6		
	x =						350	8,5-8,7	1	
ca.51	11,5 4,0	1130-1145 1205-1235		,			450-510	2,0		

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

	ill-load stop	6 Rotational- speed limitat	3a Fu	el delivery aracteristics	Starting f	uel delivery 5	48) Idi		
rev/min	emp. 40°C (104°F) cm <sup>3</sup> /1000 strokes	Note: changed to) rev/min	rev/min	cm\$/1000 strokes	rev/min .	cm#1000 strokes	rev/min	Control rod travel mm	
1080	112,0-114,0 (110,0-116,0)	1130-1145*	-	-	100	15,0-15,5 mmRW			

Checking values in brackets

\* 1 mm less control rod travel than col 2

5.81

**BOSCH** 

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 2. Edition

PE 8 P 110 A 920 RS 339

RQV 200-1050 PA324R, 325R

supersedes

12.76

200-900 200-750

company: engine:

Rolls Royse C 8 T

C 8 M

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

		(2,45-2,65)	11111 (110111 000)			
Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	11,7 - 11,9	0,4(0,8)			
	+ 0,1		1			
200	8,5-8,7	1,6 - 2,2	0,4(0,7)			
	İ					

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

200-1050

Upper rated :	speed	· · · · · · · · · · · · · · · · · · ·	Intermediate	rated sp	eed	Lower rated	speed	•	Slidings	leeve travel
Degree of deflection of control lever	rev/min Control rod travel mm 2	Control rod travel mm rev/min 28	Degree of deflection of control lever	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3	rev/min	mm 11
ca.68	1050 1250	15,2-17,8 0 - 1	-	_	-	ca.12	100 200	min.7,5 5,9-6,1 80= 2,0	200 1070	0,6-1,6 8,3
ca.66	11,0 4,0	1050-1055 1120-1150				<b>3</b> a	700	0 - 1		

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel deliv	very characteristics (5a)	Idle	fuel delivery 6	Torque- travel	control 5
rev/min cm³/1000 strokes .		rev/min 4a	rev/min	v/min cm³/1000 strokes		rev/min cm <sup>3</sup> /1000 strokes		travel mm
1	2	3	4	5	6	7	8	9
1000	117,0-119,0 (114,0-122,0			·	100	15 - 16mmRW		
			}					./.

Checking values in brackets

\* 1 mm less control rod travel than col. 2

1.79

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
© by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH

		<u>Settings RO</u>	<u>v</u>		····				<del> </del>	-2-
Upper rated:	speed	•	Intermedial	e rated sp		Lower rated	speed		Sliding •	leeve travel
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Torque-c	ontrol trave
1	2	3	4	5	6	7	8	9	10	11
200-750	PA324	1R, 325R					•			
ca.68	755 800 830 880	7,0-12,3		-	_	ca.12	100 250 400 500	5,4-8,2 3,2-4,4 1,2-2,5 0	755 	8,3 -
200-900	PA324	IR, 325R			<u></u>	<u> </u>	<u> </u>	<u></u>		
ca.68	920 950 1020 1080	15,0-18,4 10,4-14,6		-	-	ca.12	150 250 400 590	5,7-8,0 3,1-5,3 1,8-3,5	915	8,3
			٠							
									. <b>.</b>	
				· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·			<u> </u>	
									· · · · · · · · · · · · · · · · · · ·	
								•		

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 2. Edition

En.

PES 6 P 110 A 320 RS 317

RQV 375-1100 PA 247 KR RQV 375-1100 PA 200 KR ./. supersedes compañy:

Allis Chalmers

engine:

Typ: 11 000

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

 $( + 0,15 \\ - 0,05 )$ 

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,1 - 16,8	0,7			
600 600 600 200	9 12 15	8,4 - 9,6 15,1 - 16,6 21,3 - 23,2 6,8 - 8,0				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

RQV ... 247 KR

Upper rated	ř i	1		Intermediate	rated spe		Lower rated	speed	1	Sliding sleeve travel	
Degree of deflection	rev/min Control	Control rod travel	<b>(1a)</b>	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel		, O j
of control lever	rod travel	mm rev/min	<b>28</b>	of control lever	rev/min	mm ④	of control lever	rev/min	mm ③	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11 !
ca.66	1130 1200 1300 1390	15,0-17 9,0-13 0 - 7 0		-	•	-	ca.20	300 400 600 850	9,6-12,7 4,8- 6,4 2,8- 4,1 0	400	0 - 1,4 2,8-3,4 5,0-5,4 8,3 end (11)

Torque control travel a =

mn

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roc Test oil ten		Rotational-speed (2b) Fuel delivery (high idle speed) intermediate speed		rery characteristics 5a peed 5b	Starting Idle switchir	$\mathbf{O}$	Torque- travel	Control rod
rev/min	cm³/1000 strokes	rev/min 49	rev/min	rev/min cm <sup>3</sup> /1000 strokes r		cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
LDA 1090	0,6 bar 138,0-140,0	1140-1150*	LDA 600	0,6 bar 151,0-157,0	100	80,0-120,0		
			LDA 600	0 bar 100,0-108,0	375 300	8,0- 18,0 118,0-128,0		
				Cha	nge-o	ver point 200	-300	U/min.

Checking values in brackets

\* 1 mm less control rod travel than col. 2

10.75

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung. C by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany. Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

-2-

#### **B. Governor Settings**

Control rod

15,0-18,0 11,0-15,0

6,6-11,8

rev/min

rev/min

Control rod travel mm

1100

1150

1200

mm

Upper rated speed

Degree of

deflection of control lever

ca.66

	375-1100 PA 200 KR 317 / 200 KR											
Intermediate Degree of deflection of control lever		Control rod travel mm 4	Lower rated Degree of deflection of control lever		Control rod travel mm 3	Sliding s rev/min 10	mm					
 -	-	-	ca.15	200 300 400	12,0-15,0 8,4-11,6 5,0- 6,8	900	3,0-3,6 6,0-6,5 end					

3,1-4,4-1360(11)600 1250 1,8-8,6 850 1360 (3a)

Torque control travel a = C. Settings for Fuel Injection Pump with Fitted Governor

(1a)

Full-load de Control-ros Test oil ten		Rotational-speed (2b) limitation intermediate speed	characteristics		Starting idle switchir	fuel delivery 6	Torque- travel	Control cod
rev/min	cm <sup>3</sup> /1000 strokes	rev/min (4a) 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	travel mm 9
1090	138,0-140,0	1140-1150*	600	151,0-157,0	370 300 Chang	80,0-120,0 8,0- 18,0 89,0- 99,0 e-over point 230 min-1		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### D. Adjustment Test for Manifold Pressure Compensator

Test at n =

rev/min decreasing pressure – in bar gauge pressure

Pump/governor	Setting	Mea	surement	diminution Control rod travel- difference
	Gauge pressure =	bar Gau	ge pressure =	bar mm
317 / 247 KR	0,12			-2,1-2,2 mm
	,		0,41	-0,2-0,4 mm

600

0,6



## **Test Specifications** Fuel Injection Pumps 1 and Governors

VDT-WPP 001/4 1. Edition

PES 6 P 110 A 320 RS 318

ROV 300-1025 PA 173 KR 300-1000 PA 217 KR 300-1000 PA 294 KR ./. supersedes

Allis Chalmers company: 11 000 engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 $( \begin{array}{c} + 0.15 \\ - 0.05 \end{array} )$ 

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	15,4-16,1	0,6			
600	15	21,1-22,8	1			
400	9	7,0-8,2				
	ļ					
		1				<u> </u>

Adjust the fuel delivery from each outlet according to the values in [

**B. Governor Settings** 

RQV 300-1025 PA 173 KR RQV 300-1000 PA 217 KR

Upper rated s	speed			Intermediate	rated spe	eed		Lower rated	speed		Sliding s	leeve travel
deflection	rev/min Control	Control rod (travel		Degree of deflection		travel def		Degree of deflection		Control rod travel		
of control lever	rod travel	mm rev/min (		of control lever	rev/min	mm (4		of control lever	rev/min	mm 3	rev/min 10	mm 11
1	2	3		4	5	6	4	<u>′</u>	8	9	10	
ca.66		15,0-18,0 10,8-15,0 5,8-11,0 0,7- 7,8	0	-	-	-			250 300 350 400 550	6,4-8,0 4,8-7,0 3,0-5,2 2,2-3,8	380 550 1000	1,8-2,6 3,8-4,6 7,5-7,9
								<u>3a</u>				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel deliv	rery characteristics 5a	Starting idle switching	<u> </u>	Torque- travel	control 5  Control rod
rev/min	cm³/1000 strokes	rev/min 48	rev/min	- cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
318 /	173KR:				100	80,0-120,0		
1015 318 /	89,0 - 91,0 217 KR:	1145-1155*	700	96,0-100,0	300	19,0- 23,0		
1000	135,0-137,0	1030-1050*	700	123,0-127,0		ge-over point 250 min <sup>-1</sup>		,
								-/-

Checking values in brackets

\* 1 mm less control rod travel than col. 2

10,75



B.	Governor	Settings
----	----------	----------

Upper rated s	peed	1		Intermediate	rated spe	ed	Lower rated	speed		Sliding sleeve travel	
deflection	rev/min Control rod travel mm	rev/min	(a) (2a)	Degree of deflection of control lever	rev/min		Degree of deflection of control lever	rev/min	Control rod travel mm 3	rev/min	mm 1
<u> </u>	2	3		4	5	6	7	18	9	10	11
ca.66		15,0-18 10,8-15 5,8-11 0,7- 7	,0 ,6	-	-	~	ca.10	250 300 350 400 550	6,4-8,0 4,8-7,0 3,0-5,2 2,2-3,8	550	1,8-2,6 3,8-4,6 7,5-7,9
							(3a)				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ros Test oil ten rev/min 1		Rotational-speed (2b) limitation intermediate speed rev/min 3	Fuel delix characte high idle : rev/min 4	istics	idle switchin	fuel delivery 6 ng point cm <sup>3</sup> /1000 strokes	Torque- travel rev/min	Control 5  Control rod travel mm
LDA 1000	1,1 bar 135,0-137,0	1030-1040*	LDA 500 LDA 500	1,1 bar 131,5-135,5 0 bar 75,5- 83,5		80,0-120,0 19,0- 23,0 e-over point 250 min-1		

Checking values in brackets

\* 1 mm less control rod travel than col 2

## D. Adjustment Test for Manifold Pressure Compensator

Test at n =

decreasing pressure – in bar gauge pressure in services in the service of the ser

Pump/governor	Setting	Measurement	diminution Control rod travel-
	Gauge pressure = bar	Gauge pressure = bar	difference mm
318 / 294 KR	0,75 - 0,80		- 0,1 mm
		0,19 - 0,26	- 2,3 mm

500

1,1

WPP 001/4 1. Edition

PES 6 P 110 A 720 RS 352

ROV 300/600 - 1050 PA 358 KR

supersedes -

PA 359 KR

company: Mack ET 673

358 KR = Dimension B

359 KR = Dimension PLE - .685-745 inch - see pag.2!

(260 HP)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed rev/min	Control rod travel  Fuel delivery  cm³/100 strokes  3		Difference cm <sup>3</sup> / 100 strokes	Control rod travel mm	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	15,8 - 16,4	0,4			
300	6,0	0,7 - 2,7				

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

...358 KR

Upper rated s	speed		Intermediate	rated sp	eed	Lower rated	speed	•	Stiding sleeve travel	
Degree of deflection of control	rev/min Control rod travel	Control rod ta	Degree of deflection of control		Control rod travel	Degree of deflection of sontrol		Control rod travel	S.I.S.II.	0
lever	mm	rev/min (2a)	lever	rev/min	mm 4	lever	rev/min	mm (3)	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	1050	.16,4-18,8	-	-	.,	ca.19	250	9,8-11,5	300	0,8-2,1
1	1150	4,2-10,0					400	2,2- 5,2	400-	550 2,9-4,4
	1200	0 - 5,6					700	0,8-2,0	900	5,8-6,2
Ì	1260	0					830	0	1000	7,9
						<u>3a</u>				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten	stop	Rotational-speed 2b limitation intermediate speed	Fuel delivingh idle s	very characteristics 5a	Starting Idle switchin		Torque- travel	control 5  Control rod
rev/min	cm <sup>3</sup> /1000 strokes .	rev/min 49	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min mm	
1	2	3	4	5	6	7	8	9
1050	171,0-173,0	1090-1100*	750	166,0-170,0	100	110,0-170,0	1050	12,5
			500	132,0-138,0	300 1155	19,0- 39,0 29,0- 59,0	750 500	12,7 11,5

Checking values in brackets

\* 1 mm less control rod travel than col. 2

4.77

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.

© by Robert Bosch GmbH, D-7 Stuttgert 1, Postfach 50 Printed in the Federal Republic of Germany.
Imprime en Republique Fédérale d'Allemagne par Robert Bosch GmbH.

**B.** Governor Settings

Upper rated s	peed			Intermediate	rated spe	ed	Lower rated	speed		Sliding s	eeve travel
Degree of deflection of control lever	Control rodtravel	travel mm		Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	1
1	2	3		4		6	7		9	10	11
ca.68	1050	16,4-18,8	3	_	-	•	ca.19	250	9,8-11,5	300	0,8-2,1
	1150	4,2-10,0	0					400	2,2-5,2	400-5	60
	1200	0 - 5,6	6					700	0,8-2,0	900	2,9-4,4 5,8-6,2
	1260	0						830	0	1050	7,9
							(3a)				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roc Test oil ten	d stop	Rotational-speed (2b) limitation intermediate speed	Fuel deliv	rery characteristics (5a) speed (5b)	Starting Idle switchir	$\sim$	Torque- travel	Control od
rev/min	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm3/1000 strokes	rev/min 8	travel mm
1050	173,0-175,0	1090-1100*	750 500 PLE 300	168,0-172,0 134,0-140,0 99-119	100 300 1155	110,0-170,0 19,0- 39,0 29,0- 59,0	1050 750 500	12,5 12,8 11,5

Checking values in brackets

• 1 mm less control rod travel than col. 2

#### **B.** Governor Settings

Upper rated s	peed			Intermediate	rated spe	ed	Lower rated	speed	Slidings	leeve travel	
deflection	rev/min  Control  rod travel	Control rod travel	(ta)	Degree of deflection of control		Control rod travel	Degree of deflection of control	l	Control rod travel		0
		rev/min	(2a)	lever	rev/min	mm ④	lever	rev/min	mm 3	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
					į						
							3a)				

Torque control travel a =

----

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-rod Test oil tem		Rotational-speed (2b) limitation intermediate speed (4a)	Fuel deliv	very characteristics 5a speed 5b	Starting Idle switchir		Torque- travel	Control rod
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>4</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

\* 1 mm less control rod travel than col. 2

## Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 19,1 i 1

2. Edition

PE 12 P 110 A 320 LS 830

RQ 1050 PA 374 R (1) RO 1050 PA 310 (2) supersedes 10.79

company:

Daimler-Benz OM 404 A

engine: 336 kW(457PS)

336 kW(457PS) (1) 407 kW(553PS) (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

3,30 Cyl

Cy1. 12

Port closing at pres	STOKE	<u>(3,15-3,35)                                   </u>	mm (from BDC)			
Rotational speed	Control rod travel	Fuel delivery  cm <sup>3</sup> /100 strokes	Difference cm <sup>3</sup> / 100 strokes	Control rod travel	Fuel delivery cm <sup>3</sup> /100 strokes	Spring pre-tensioning (torque-control valve)
rev/min 1	mm 2	3	4	mm 2	3	6
1000	12,9-13,0	14,0-14,2	0,4(0,8)			
300	7,3-7,5	1,1- 1,7	0,4(0,7)			
				!		
	ŀ					

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

PA 374

Upper rated	speed	1	Intermediate	rated spe	eed	Lower rated	speed	9	Sliding aleque trave		
deflection	rev/min Control	Control rod te	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel		0	
of control lever	rod travel mm	mm rev/min 28	of control lever	rev/min	mm 4	of control lever	rev/min	mm ③	rev/min	mm	
1	2	3	4	5	6	7	8	9	10	11	
	11,9	1055-1066									
	6,0	1095-1105									
İ	0-1	1200						,			
Ì											
						(3a)				L	

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		Ilmitation intermediate speed				fuel delivery 6	Torque- travel	Control Control rod
rev/min	cm³/1000 strokes	rev/min (4a)	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9
1000	140,0-142,0 (137,0-145,0			·	100	110,0-130,0		

Checking values in brackets

\* 1 mm less control rod travel then col. 2

2.80

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
C by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany. Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

①

PA 310

Upper rated :	speed		Intermediate	rated spe	ed	Lower rated	Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rodtravel mm	Control rod (1a) travel mm rev/min (2a)	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel		mm	
1	2	3	4	5_	6	7	8		10	11	
	12,7	1055-1060									
	5,9	1095-1105						ŀ			
	0-1	1200									
						(3a)					

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten	d stop	Rotational-speed (2) limitation intermediate speed	Fuel deli high idle	very characteristics 5a	Starting Idle switchin		Torque- travel	control 5
rev/min 1	cm <sup>3</sup> /1000 strokes	rev/min 4	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm3/1000 strokes	rev/min	Control ro- travel mm
1000	155,0-157,0 (152,0-160,0)	1055-1060*			100	110,0-130,0		N

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### **B.** Governor Settings

Upper rated s	speed			Intermediate	rated spe	ed	Lower rated	speed		Clidita	laawa Arawal
	rod travel mm	Control rod travel mm rev/min	(a) (2a)	Degree of deflection of control lever		Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel mm 3	rev/min	mm
1	2	3		4	5	6	7	8	9	∜0	11
							3a)				<i>;</i>

Torque control travel a =

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten	d stop	Rotational-speed (2b) imitation intermediate speed	Fuel deliv	very characteristics 5a speed 5b		fuel delivery 6	Torque- travel	Control rod
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>4</sup> /10/00 strokes 7	rev/m/in	travel mm
			,			•		

Checking values in brackets

• 1 mm less control rod travel than col. 2 2.80

## **Test Specifications** Fuel Injection Pumps 1 and Governors

VDT-WPP 001/4 MB 19,1

3. Edition

LS 820	350-1250 PA 182 R PA 251 R	(1) superse (2) compar	<sub>rdes</sub> 10.74 Daimler-Benz <sup>ny:</sup> OM 404
12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 0 -45 -60 -105-120-165-180-225		(3) engine: $\begin{pmatrix} +0,5\\ -0,75 \end{pmatrix}$	

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

3,4+0,1

mm (from BDC) Cyl. 12 (+ 0,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7 - 12,4	0,5			
600 600	9 15	5,0 - 6,2 15,3 - 17,0				
200	9	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

350-1250 PA 182 (1)

1	Upper rated s	peed			Intermediate	rated spe	eed	Lower rated	speed		Slidina s	laeve travel
ı	deflection of control	rev/min Control rod travel	trave:		Degree of deflection of control		Control rod travel	Degree of deflection of control		Control rod travel		0
	lever 1	mm 2	rev/min ( 3	28)		rav/min 5	mm (4) 6	lever 7	rev/min 8	mm (3) 9	rev/min 10	mm 11
	ca.68		15,0-18,0 10,2-14,8 2,5- 9,9	3	-	<u>-</u>	-	ca.17	200 350 600 900	8,7-11,0 5,7- 7,9 3,0- 4,5		8,3
								<u>3a</u>				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

1 .		Rotational-speed (2b) Fuel delivery character limitation high idle speed (5b) rev/min cm³/1000 s			Idle switching point rev/min cm³/1000 strokes			control 5  Control rod travel mm
(1) 1240	110,0-112,0 (108,0-114,0	1285-1295 <b>*</b>	A	1365-1385:4, spersion max ge-over point	. 6 c	11 - 13 RW n <sup>3</sup> -250 U/min	8	9

Checking values in brackets

\* 1 mm less control rod travel than col. 2

6.75

Upper rated s	peed		Intermediat	e rated sp	eed	Lower rated	speed			
Degree of deflection of control lever		travel mm	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel		leeve travel
1	2	3	4	5	6	7	8	9	10	11
ca.68	1265 1320 1400 1520	15,0-18, 10,2-14, 2,5- 9, 0	3	-	-	ca.17	200 350 600 900	8,7-11,0 5,7- 7,9 3,0- 4,5		8,3
						3a)				

Torque control travel a =

**B.** Governor Settings

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roc Test oil ten		Rotational-speed (2b) limitation intermediate speed	Fuel deli high idle :	very characteristics 5a speed 5b	Starting Idle switchir		Torque- travel	control 5
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min	cm3/1000 strokes	rev/min	Control rod travel mm
1240	110,0-112,0 (108,0-114,0			74,0-76,0** (72,0-78,0) 1365-1385: 4 spersion max ge-over point	,5 mmi	RW		

\*\* Set reduced delivery (75%= standard) at reduced-delivery lever!
With 85%=89.0-91.0 cm³ or 60%=59.0-61.0 cm³, this must be marked on the nameplate or indicated by DB.

**B. Gevernor Settings** 

RQV ..280R (3)

Upper rated :	speed			Intermediate	rated spe	ed	Lower rated	speed		<del></del>	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	(1a) (2a)	Degree of deflection of control lever	rev/mın	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel	Sliding si	mm
1	2	3		4	5	6	7	8	9	10	11
ca.68	1150 1180 1250 1330	15,0-18 9,0-14 0 - 7 0		-	-	-	ca.12	230 350 500 740	7,1-8,2 5,4-6,7 1,8-3,7	1130	8,3
							<b>3</b> a				

Torque control travel a =

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ter		Rotational-speed (2b) Ilmitation Intermediate speed	Fuel deli high idle	very characteristics 58 speed 50	Starting Idle switchin		Torque- travel	control 5
rev/min 1	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>4</sup> /1000 strokes 7	rev/min 8	Control ro travel mm
(3)	96,0 - 98,0 (94,0 -100,0)			1180-1200: 4 spersion max e-over point	. 6 cm			

Checking values in brackets

\* 1 mm less control rod travel than col. 2

# Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

4. Edition

En

PES 8 P 110 A 321 RS 283, Z

RQV 250-1150 PA 254 R RQV 250-1150 PA 255 DR ./. supersedes 1.75 company: Berliet V 835

Cam sequence and angular cam spring 1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je  $45^{\circ}$   $( \frac{+0.5}{-0.75} )$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Cyl. 5  $\binom{+0,15}{-0,05}$ 

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,8 - 13,5	0,5			
600	9 15	6,6 - 7,7 17,5 - 19,5				
200	9	4,6 - 5,8				

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

RQV .. PA 254

Upper rated s	speed			Intermediate	rated sp	eed	Lower rated	speed	4	Sliding sleeve trave		
	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	(18) (28)	Degree of deffection of control lever	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel mm 3	rev/min	mm 11	
ca.68	1170 1220 1300 1420		<b>,</b> 5	-	-	-	ca.12	100 250 420 600 710	6,1-8,0 4,9-6,7 2,0-3,9 0,3-1,8	1190	8,3	
							<b>3</b> a					

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten		Rotational-speed 20 limitation intermediate speed	Fuel deliv	very characteristics 58 peed 5b	Starting Idle switchir	<u> </u>	Torque- travel	control 5  Control rod
rev/min	cm³/1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
283: 1150	  109,0-111,0  106,0-114,0)	1185-1195*			100	120 - 150		
283Z: 1150	102,5-104,5 99,5-107,5)	1190-1200*			250 Chang 130-2	15 - 21 e-over point 200 U/min		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung. C by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany. Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

Upper rated s	peed			Intermediate	rated spe	ed	Lower rated	speed		Slidings	leeve travel
Degree of deflection of control lever	rev/min Control rodtravel mm	travel mm	<u> </u>	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm (1)
1	2	3		4	5	6	7	8	9	10	11
ca.68	1170 1220	15,0-18, 10,2-14,	5		-	-	ca.12	100 250	4,9-6,7	1190	8,3
	1300 1420	1,8-11, 0	0,					420 600 710	2,0-3,9 0,3-1,8 0	1150 500	0 1,0 <b>-1,</b> 2
							<b>За</b> .				

Torque control travel a = 1 3 mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-rod Test oil tem	d stop	Rotational-speed (2b) limitation intermediate speed	Fuel deliv	very characteristics 5a speed 5b	Starting Idle switchin		Torque- travel	Control rod
rev/min	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/mın	cm3/1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1150	97,0 - 99,0	1185-1195*		99,5-102,5 103,0-107,0	100	110 - 150		
			500	96,0-102,0	250	15 - 21		
(inrea	se by ± 3,0 d	m³!)				ge-over point 200 U/min		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### **B. Governor Settings**

Upper rated	speed			Intermediate	rated spe	ed	Lower rated	speed			Slidings	eeve travel
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	(a) (2a)	Degree of deflection of control lever	rev/min	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel mm	_	rev/min	mm
							<b>3</b> a)					

Torque control travel a =

mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten	elivery 1 stop 1p. 40°C (104°F) 2	intermediate speed	Fuel deliv	very characteristics 59 speed 56	Starting Idle switchir		Torque- travel	Control 5
rev/min	cm <sup>3</sup> /1000 strokes	rev/min (4a)	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>8</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

\* 1 mm tess control rod travel than col. 2

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 19,1 f 4. Edition

PE 12 P 100 A 320 LS 828 RQ 750 PA 374 R

2.80 supersedes

company:

Daimler-Benz

OM 404

12- 1- 5- 9- 8- 3- 4- 11- 10- 2- 6- 7  $\pm 0,50$ 0 -45-60-105-120-165-180-225-240-285-300-(0,75)

engine:

205 kW (279 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC) (2 15-2 35)

Cy1. 12

		3,10-3,301				
Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
730	11,3-11,4	8,7 - 8,9	0,3(0,6)			
300		1,2 - 1,8	0,3(0,5)			
			:			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

	rev/min	Control rod (a)	Intermediate Degree of deflection	rated sp	ced Control rod travel	Lower rated Degree of	speed	Control rod	Sliding s	sleeve travel
of control lever	rod travel mm		of control	l	mm 4	deflection of control lever 7	rev/min 8	mm 3	rev/min 10	mm 11
ca.28	10,3	750-755	•	-	-	_	_	-	750	3,8
	5,3	780-790						ŀ		
	850	0 - 1	1							
						<b>38</b>	   			

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-ros Test oil ten rev/min		Rotational-speed 2b limitation intermediate speed rev/min 4a	high idle speed 5b rev/min cm³/1000 strokes		Starting Idle switchir rev/min	<b>1</b> _	Torque-control 5 travel Control ro travel rev/min   mm	
730	87,0-89,0 (85,0-91,0)	3 750-755*	4	5	100 100	15,0-15,5 (80)	8	9

Checking values in brackets

\* 1 mm less control rod travel then col. 2

2.81

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung. C by Robert Bosch GmbH. D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany. Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

VDT-WPP 001/4

3. Edition

PE 6 P 100 A 320 RS 284 EP/RSV 300-1100 P1/808D 300-1100 P1/811D supersedes 4.74,12.74 Berliet MS 635 T

Manifold-pressure compensator adjustment see page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke 2,0+0,1

Festoil-ISO 4113

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min 1	mm 2	cm <sup>3</sup> /100 strokes	cm³/ 100 strokes 4	mm 2	cm <sup>9</sup> /100 strokes	mm 6
1000	12	10,5 - 11,2	0,6			
600	9 15	3,1 - 4,3 14,8 - 16,7				
200	9	1,8 - 3,0				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

EP/RSV .. 808 D

Degree of deflection of control lever	Control rod travel mm	rev/min Control rod travel mm rev/min 3	Interme	ediate ra	ted speed	Control- lever deflection in degrees 7	Low/ rev/min 8	Control rod travel mm	3 To	rque control  Control rod  travel  mm
ca.61	1100 1150 1190	16,0 11,6 6,6	10	without auxiliar spring with auxiliary spring			300 100 300	8,3 19 - 21 8,0-8,6	1080	0
29	1170 1250 1340	7,5-11,5 1,7- 4,4 0,3- 1,0	with				500 500 660	1,5-5,0 0 - 1	450	1,7-1,9

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

<b>2b</b> Fu	Full-load stop  St oil temp 40°C (104°F)  Rotational-speed limital	6 Rotational- speed limitat	(3a) Fu	uel delivery naracteristics	Starting l	luel delivery 5	(4a) (d)	4a Idle stop	
Test oil te rev/min 1	emp 40°C (104°F) cm³/1000 strokes 2	Note: changed to ) rev/min 3	rev/min	cm <sup>9</sup> /1000 strokes 5	rev/min	cm#1000 strokes	rev/min	Control rod travel mm	
0,85 1100 900	bar 141,0-143,0 154,0-158,0	0,85 bar 1160-1170	500 60	0,35 bar 150,0-160,0 bar	100	min. 150			
650 (inre	164,0-170,0 ase by ± 2,0 cm	³!)	350 1180-	113,0-117,0	300	14,0-20,0			

Checking values in brackets

\* 1 mm less control rod travel than col 2

12.75

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Federale d Allemagne par Robert Bosch GmbH.

#### **B. Governor Settings**

EP/RSV .. 811D

Degree of deflection of control lever	r rated speed Control rod travel mm	rev/min   Control rod   travel   mm rev/min   3	Interme	ediate rate	ed speed	Control- lever deflection in degrees 7	Lowe rev/min 8	Control rod travel mm	3 To	Control rod travel mm
ca.59	1100 1150 1200	16,0 10,2 4,5	with spri		uxilia	ca.25	300 150	8,1 19 - 21	1080	0
29	1100 1160 1250	ca.12,8 ca.10,2 0,3-1,0	1	auxi	liary		300 500 680	7,8-8,4 1,3-4,7 0 - 1		

## C. Settings for Fuel Injection Pump with Fitted Governor

<b>U</b>	ull-load stop emp. 40°C (104°F)	8 Rotational- speed limitat.		uel delivery naracteristics	Starting l	fuel delivery 5	(4a) Idi	e stop
rev/min 1	cm <sup>3</sup> /1000 strokes 2	Note: changed to) rev/min 3	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes	rev/min 8	Control rod travel mm
	0,85 bar 143,0-145,0 163,0-167,0 168,0-174,0	1160-1170	500 0 350	0,36 bar 154,0-164,0 bar 113,0-117,0	100 300	150-190 15- 23		
(inr	ease by $\pm$ 2,0 cm	<sup>3</sup> !)						

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### D. Adjustment Test for Manifold Pressure Compensator

Test at n =

Testoil-ISO 4113

rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
284 / 808DR	0,35-0,36	0,19-0,22	-0,1 -2,1
284 / 811DR	0,46-0,48	0,18-0,22	-0,1 -2,7

Notes:

(1) when n =

1100 rev/min and gauge pressure =

0,85 bar (= maximum full-load control rod travel)

En

WPP 001/4 MB 9,6g 1. Edition

PE 6 P 100 A 320 LS805

EP/RSV 350-750 P.1/814R

supersedes \_

 $6 - 3 - 5 - 2 - 4 - 1 \pm 0.5$ 

350-900

company Daimler-Benz

0 -45 -120-165-240-285° (±0,75)

OM 401 engine (1-81/90 kW - 110/122 PS)

(2-96/106kW - 130/144 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Set idle-speed auxiliary spring at 2.0 mm control-rod travel, then

A. Fuel Injection Pump Settings

1/2 turn back.

Port closing at prestroke

Testoil-ISO 4113

3,40-3,50 (3,35-3,55)

mm (from BDC) Cyl.6

Rotational speed	Contro! travel	, ivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve	
rev/min 1	mm 2	2) c trokes	cm³/ 100 strokes 4	mm 2	cm <sup>9</sup> /100 strokes 3	mm 6	
1000	12	11,7-12,4	0,4				
600	9 15	5,0 - 6,2 15,3-17,0					
200	9	3,5-4,5					

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

1 Uppe	r rated speed		Intermediate rated speed 4			(4)	Low	er rated speed	(3) To	rque control
Degree of deflection of control lever	Control rod travel   mm rev/min					Control- lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca.44	750 800	16,0 11,8	with	without auxiliary spring			350	5,3		**
	850	6,2					100	19 - 21		: :
29	750 790 850	ca.10,0 ca. 4,5 0,3-1,0					350 450	5,5-6,1		

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

	ill-foad stop	6 Rotational- speed limitat		Fuel delivery Starting fuel characteristics Idle				e stop
rev/min	emp. 40°C (104°F)	Note. changed to) rev/min	rev/min	cm³/1000 strokes	rev/min .	cm <sup>2</sup> 1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
730	79,0-81,0 (77,0-83,0)	750-760*		. di	100 780- spersion	110 - 130 795=4,5mmR I max. 6		

Checking values in brackets

\* 1 mm less control rod travel than col. 2 8.78

BOSCH

Geschaftsbereich KH. Kundendienst. Kfz-Ausrüstung. c. 1980 by Robert Bosch GmbH. Postlach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprimé en République Fédérale d'Allemagne par Robert Bosch GmbH.

#### **B. Governor Settings**

350 - 900

Degree of deflection of control lever	r rated speed Control rod travel mm		Interme	diate rated	speed 6	Control- lever deflection in degrees 7		rated speed Control rod travel mm	rque control   Control rod   travel   mm
ca.44	750 800 850	16,0 11,8 6,2	with spri	out au ng	xilia	ca.25	350 100	5,8 19 - 21	**
ca.47	880 945 1000	ca.10,0 ca. 4,5 0,3-1,0					350 450	5,5-6,1 0 - 1	

#### C. Settings for Fuel Injection Pump with Fitted Governor

	ull-load stop emp. 40°C (104°F)	6 Rotational- speed limitat.	(39) Fu	Fuel delivery characteristics Sta		uel delivery 5	4 idi	idle stop		
rev/min	cm <sup>3</sup> /1000 strokes	changed to)	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	travel		
870	86,0-88,0 (84,0-90,0)	895-905*		dis	100 935-9 persio	110-130 950:4,5mm R n max. 6	W			

Checking values in brackets

Testoil-ISO 4113

\* 1 mm less control rod travel than col. 2

#### **B.** Governor Settings

Degree of deflection of control lever	deflection travel travel of control mm mm rev/min				speed 6	Control- lever deflection in degrees 7	Lower rev/min 8	rated spe Control ( travel mm		Torque control Control rod travel rev/min mm 10 11			
	:		3						_				
28													

## C. Settings for Fuel Injection Pump with Fitted Governor

<b>2b</b> Fu	III-load stop	6 Rotational- speed limitat.	Starting fuel delivery 5 characteristics						
Test oil to rev/min 1	emp. 40°C (104°F) cm³/1000 strokes 2	Note: changed to) rev/min 3	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes	rev/min 8	Control rod travel mm 9	
			·	_					

Checking values in brackets

\* 1 mm less control rod travel than col. 2

40

VDT-WPP 001/4
2. Edition

En

PE 5 P 100 A 321 RS 274

EP/RSV 250-1200 P1/376DR

supersed∈s 10.74

PE 6 P 100 A 321 RS 275

EP/RSV 250-1200 P1/376DR 250-1200 P1/393 R 300-1200 P2/403 R company Berliet MJ 520 MJ 620

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1

mm (from BDC,RW 9

 $(^{+0,15}_{-0,05}$  -

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min 1	mm 2	cm³/100 strokes 3	cm <sup>9</sup> / 100 strokes 4	mm 2	cm <sup>9</sup> /100 strokes 3	mm 6
1000	12	9,2 - 9,9	0,4			
600	9 15	2,1 - 3,1 13,4 -15,0				
200	9	0,6 - 1,8				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Testoil-ISO 4113

..376DR

1 Uppe	r rated speed	rev/min	Interme	diate rate	d speed	4	Lowe	er rated speed	(3) To	rque control
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control- lever deflection in degrees 7	rev/min	Control rod travel mm	rev/min	Control rod travel mm
ca.63	1200 1250 1270	16,0 10,3 7,0	1	without auxilian spring with auxiliary spring			250 100	8,5 19 - 21	1180	0
<b>2</b> 3	1250 1300 1420	8,3-11,4 4,0-6,1 0,3-1,0					250 400 650	8,2-8,8 4,4-6,4 0 - 1	350	1,4-1,6

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

ピツ	ill-load stop	6 Rotational- speed limitat		el delivery paracteristics	Starting f	uel delivery 5	4a Idle stop	
Test oil te rev/min 1	emp. 40°C (104°F) cm <sup>3</sup> /1000 strokes 2	Note. changed to .) rev/min 3	rev/min	cm\$1000 strokes	rev/min .	cm#1000 strokes	rev/min	Control rol travel mm
5, 6 1200	Cyl. 88,0-90,0 (87,0-91,0)	1230-1250*			100	140-170 11- 17		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

5.77

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

#### **B. Governor Settings**

Degree of deflection of control lever	r rated speed Control rod travel mm		Interme	Intermediate rated speed 4 5 6			Lower rev/min 8	rated speed  Control rod  travel  mm	3 To rev/min 10	rque control   Control rod   travel   mm   11
ca.63	1200 1270 1300	16,0 7,3 2,8	without auxilian			ca.23 ry	250 100 250	8,5 19 - 21 8,2-8,8	1180	0
29	1250 1300 1420	8,5-11,1 3,5- 5,2 0,3- 1,0	with auxiliary spring				400 600	2,2-4,4	300	1,2-1,8

#### C. Settings for Fuel Injection Pump with Fitted Governor

chan		6 Rotational- speed limitat.		uel delivery paracteristics	fuel delivery 5			
		Note: changed to) rev/min 3	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	95,5-97,5	1260-1270 <sup>-</sup>			100	140-170		
					250	11-17		
	/							

Checking values in brackets

Testoil-ISO 4113

\* 1 mm less control rod travel than col. 2

### **B. Governor Settings**

	275	1	403	R
--	-----	---	-----	---

Degree of deflection of control lever	Gree of lection control mm Control rod travel travel mm rev/min		Interme	diate rated	speed	Control- lever deflection in degrees 7	Lower tev/min	er rated speed Control rod travel mm	3 To	rque control Control rod travel mm
ca.54	1200 1300 1350	16,0 10,3 7,2		without auxiliar spring with auxiliary spring			300 100 300	8,9 19 - 21 8,6-9,2	1200	0
ca.52	1300	ca.11,7 ca. 7,1 0,3-1,0					450 650	3,5-6,0 0 - 1		

### C. Settings for Fuel Injection Pump with Fitted Governor

	ill-load stop amp. 40°C (104°F)	6 Rotational- speed limitat.		el delivery paracteristics	Starting I	fuel delivery 5	ldle stop		
rev/min	cm³/1000 strokes	changed to) rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes	rev/min 8	travel mm 9	
1200	95,0-97,0	1250-70*			100 300	145 - 180 6 - 12			
				١					

Checking values in brackets

\* 1 nm less control rod travel than col. 2

①

estoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 VOL 10,0b3

En.

NP - PE 6 P 100 A 320 RS 319 NP - RQV 250-1100 PA 307/2 R

supersedes

ompany:

ov foV

Port-closing test with/without ROBO diaphragm

2,6+0,1

engine:

TD 100 A

\*\* In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

mm (from BDC)

+0,15)

Rotational speed ravimin	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,7 - 13,4	0,5			2,5±0,1**
600	9 12 15	6,1 - 7,3 11,3 - 12,7 16,5 - 18,2				(max 2,2-2,9)
200	9	4,2 - 5,2				

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

Port closing at prestroke

RQV .. PA 307/2R

Upper rated : Degree of deflection of control lever	rev/min Control rod travel	Control rod (14 travel mm rev/min 2	of control	rated sp	Control rod travel	Lower rated Degree of deflection of control lever	speed rev/min 8	Control rod travel	Sliding s	mm
ca.50	1400	15,0-18,3 0 15,1-17,9 8,2-13,3 0 - 7,8				ca.13	100 200 300 380 490	8,9-11,0 7,2- 9,9 4,0- 6,9 0 - 3,4	1170	

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil ter		Rotational-speed 2b limitation intermediate speed	Fuel deliv	very characteristics (58)	Starting idle switchin		Torque- travel	Control rod
rev/min	cm³/1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
LDA	0,5 bar		LDA	0 bar	100	ca. 240,0		
700	145,0-148,0 (143,0-150,0		700	114,0-119,0 (112,0-121,0)	250 dis	11 - 15 persion max.	)** 2 <b>,</b> 5	
								·/·

Checking values in brackets

\* 1 mm less control rod travel then col. 2

7.76

BOSCH

Geschäftebereich KH. Kundendienst. Ktz-Ausrustung C by Robert Bosch GmbH, D-7 Stuttgert 1, Postfach 50. Printed in the Federal Republic of Germany Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH.

VOL 10,0 b 3

-2-

### **D. Adjustment Test for Manifold Pressure Compensator**

Test at n =

500

rev/min decreasing pressure – in bar gauge pressure

Pump/governor

Setting

Gauge pressure = bar

Gauge pressure = bar

O,07 - 0,12

O,07 - 0,12

Notes:

(1) when n =

700 rev/min and gauge pressure = 0,5

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

## **Test Specifications** Fuel Injection Pumps 1 and Governors

VDT-WPP 001/4 2. Edition

PES 8 P 100 A 921/5 RS 286

RQV 325-1250 PA 274 KR

supersedes

IHC-USA **DVT 800** 

company: engine:

1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 $\binom{+0,15}{-0,05}$ 

2,8+0,1 mm (from BDC)

FOIT GIOSING at pros	in ove		min (non poo)			
Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,4 - 12,0	0,4			
600	15	16,2 - 17,8	1			
200	6	2,9 - 3,9				
					]	

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

RQV .. 274 K

Upper rated	speed			Intermediate	rated sp	eed	Lower rated	speed	•	Sliding sleeve travel	
Degree of deflection	rev/min Control	Control rod travel	<b>②</b>	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel		. ①
of control lever	rod travel mm	mm rev/min	<b>28</b>	of control lever	rev/min	mm (4)	of control lever	rev/min	mm (3)	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
ca.66	1320 1400 1500 1650	15,0-18 9,8-14 1,9-8 0	,0	1	•	-		150 250 400 670	6,6-8,0 5,2-7,2 2,3-3,8 0	250 500 1000 1320 1520- 1640	0,4-1,4 3,4-3,8 5,6-6,0 8,3 End (11)

Torque control travel a =

Sect.C, col. 8!

#### C. Settings for Fuei Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel deliv	very characteristics 56 poeed 56	Starting Idle switching		Torque- travel	Control rod	
rev/min	cm³/1000 strokes .	rev/min 4a	rev/min 4	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min 8	travel mm	
LDA 1250	1,0 bar 75,0-77,0	1300-1310*	LDA 900 LDA 400	1,0 bar 92,0-96,0 0 bar 22,0-28,0			1250 900		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Ppe 286

rev/min decreasing pressure - in bar gauge pressure Test at n =

500			
Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
286 / 274KR	0,15 - 0,26	0,81 - 0,85	Induction control-rod travel + 0.1 Boost control- rod travel -0.1

Notes:

bar (= maximum full-load control rod travel)

(1) when n = rev/min and bar (= maximum full-load control rod travel)

Control-rod travel for induction and with charge-air pressure must be read off following full-load adjustment!

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4
1. Edition

PE 8 P 100 A 320 LS807

RQV 300-1250 PA 172DR

PE 8 P 100 A 320 LS813

EP/RSV 400-1100P 1/807R

8 - 7 - 2 - 6 - 3 - 5 - 4 - 1 ±0,50 0 -45 -90 -135-180-225-270-315° (±0,75 supersedes 2,8a - 5,74

company: Daimler-Benz engine: OM 402

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90

Cv1. 8

· or cooming at pres	9000	<u>2.75-2.95)</u>	man (nom obc)			
Rotational speed rev/min		Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	8,1 - 8,8	0,4			
600 600 600	9 12 15	2,7 - 3,7 6,3 - 7,5 10,9 -12,4				
200	9	0,5 - 1,4				

mm (from RDC)

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

PA 172 DR

Upper rated s	peed	<u> </u>	Inte	Intermediate rated speed				Lower rated	speed	Sliding sleeve travel		
Degree of deflection of control lever	Control rod travel	mave:	def	gree of fection control er	_	Contro travel mm	l rod	Degree of deflection of control lever	rev/min	Control rod travel mm 3		mm
ca.68	1230 1300 1340 1410	6,0-12	4	<b>-</b>	•		-	ca.12	150 300 450 680	7,2-8,1 4,6-6,7 1,5-2,9	300 800	0,4-1,5 4,4-4,8

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ter		Rotational-speed 20 limitation intermediate speed			Starting idle switching		Torque- travel	control 5
rev/min cm³/1000 strokes .		rev/min 4a	rev/min cm³/1000 strokes		rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1250	95,0-97,0 (93,0-99,0)	1290-1310*	600	75,0 - 80,0 (73,0 - 82,0	100	140.0-160.0		
					250-	-180 (270-160		.1.

Checking values in brackets

\* 1 mm less control rod travel then gol. 2

**BOSCH** 

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung. © by Robert Bosch GmbH. D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany. Imprime en République Féderale d'Alismagne par Robert Bosch GmbH.

1 Uppe	r rated speed		Interme	diate rated	i speed	(1)	- Lower	rated speed	(3) To	rque control
Degree of deflection of control lever 1	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control- lever deflection in degrees 7	rev/min 8	Control rod travel mm	rev/min	Control rod travel mm
ca.63	1100 1150	16,0 12,0		out au	ıxilia	ca.29	400	7,0	1080	0
ca.61	1200 1110 1200 1260	6,7 ca.12,0 ca. 4,0 0,3-1,0	spri	ng			200 400 500 620	19 - 21 6,7-7,3 2,0-4,3 0 - 1	450	0,9-1,1

## C. Settings for Fuel Injection Pump with Fitted Governor

	ull-load stop emp. 40°C (104°F)	Rotational- speed limitat.		uel delivery naracteristics	Starting (	fuel delivery 5	Idle stop	
rev/min	cm <sup>3</sup> /1000 strokes	changed to) rev/min	rev/min	cm <sup>3</sup> /1000 strokes 5	rav/min	cm <sup>3</sup> /1000 strokes	rev/min 8	travel mm
1080	83,0-85,0 (81,0-87,0)	1120-1130*	700 500	78,0 - 81,0 (76,0 - 83,0) 77,5 - 80,5 (75,5 - 82,5) dis	<u> </u>	110,0-130,0 (108,0-132, 1190= 5 mm RW n max. 6	1	

Checking values in brackets

Testoil-ISO 4113

\* 1 mm less control rod travel than col. 2

#### **B.** Governor Settings

Degree of deflection of control lever	Control rod travel mm	rev/min Control rod travel mm rev/min 3	intermed	diate rated	speed	Control- lever deflection in degrees 7	Lower rev/min 8	rated speed  Control rod  travel  mm  9	Tev/min	rque control   Control rod   travel   mm
		•								
29										

#### C. Settings for Fuel Injection Pump with Fitted Governor

Contract of the contract of th	ill-load stop emp. 40°C (104°F)		Rotational-speed limitat. 3a Fuel delivery characteristics			Starting fuel delivery 5   4a   Idle stop				
rev/min 1	cm <sup>3</sup> /1000 strokes 2	changed to) rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes 7	rev/min 8	travel mm 9		
				,						

Checking values in brackets En

\* 1 mm less control rod travel than col. 2

WPP 001/4 SCA 11,0

3. Edition

PE 6 P 90/720 RS 148, 204

RQV 250-1100 PA47R, 169 R

Scania

RS 148, 204

EP/RSV 350-1100 P 1/310 R

company: D 11 engine:

Port-closing test with/without ROBO diaphragm

In the case of greater dispersion alter the delivery-valve spring pre-tension a CCOrdingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 $\binom{+0,15}{-0,05}$ 

Port closing at prestroke

2,6 + 0,1

Rotational speed rev/min 1	Control rod trave! mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6				
1000	12	8,5 - 9,2	0,4			2,5 ±0,1**				
600	9 12 15	2,9 - 3,9 7,4 - 8,4 12,2 -13,5				(max.2,2-2,9)				
200	9	1,8 - 2,8								

Adjust the fuel delivery from each outlet according to the values in [

#### **B.** Governor Settings

RQV .. 47R, 169 R

Upper rated	speed			Intermediate	rated sp	eed	Lower rated	speed		Sliding	leeve travel
Degree of deflection of control tever	rev/min Control rod travel mm 2	Gontrol rod travel mm rev/min 3	(1a) (2a)	Degree of deflection of control lever	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel mm 3	rev/min	mm
ca.68	1150 1360 1100 1180 1250	15,0-17 7,3-11	,5 ,8				ca.10	200 300 450 600 740	5,8-8,0 3,1-4,4 2,2-3,5 0,8-2,0	250 400 1150	0,7-1,7 2,2-2,6 8,3
	1320	0	_ [				<b>3</b> a				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil ter		Rotational-speed 2b limitation intermediate speed	high idle speed (sh)		Starting Idle switchir		Torque- travel	Control rod
rev/min	crh³/1000 strokes .	rev/min 49	re imin	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1080	142,0-144,0 (140,0-146,0)		600	135,0-139,0 133,0-141,0 dis	225 persi	on max.1,5	)**	
				di	1200 spers	16 - 22 <sub>)</sub>		

Checking values in brackets

\* 1 mm less control rod travel then col. 2 12.76

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung. C by Robert Bosch GinbH. D-7 Stuttgart 1, Positach 50. Printed in the Federal Republic of Germany. Imprime en République Fédérale d'Aliemagne par Robert Bosch GimbH.

	r rated speed		Intermediate rated speed			<b>(4)</b>	· Lowe	er rated speed	3 Torque control		
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min	4	5	6	Control- lever deflection in degrees 7	rev/min 8	Control rod travel mm	rev/min	travel man	
ca.67	1100 1150 1200	16,0 11,7 6,0		without auxilia spring			350 100 350	6,0 19 - 21 5,7-6,3		max.	
29	1150 1200 1350	10,4-12,5 4,4- 7,8 0,3- 1,0	with	n auxil ing	liary		400 550	3,2-4,7 f, - 1			

### C. Settings for Fuel Injection Pump\_with Fitted Governor

(2b) Fu	li-load stop	6 Rotational- speed limitat. 3 Fuel delivery characteristics			Starting 1	uel delivery 6	49 Idle stop	
Test oil te rev/min 1	emp. 40°C (104°F) cm³/1000 strokes 2	Note: changed to) rev/min 3	rev/min	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control root travel mm
1100	142,0-144,0 (140,0-146,0)	1120	600		100 350 persio 1200 ispers	16 - 22	**	6,0

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### **B. Governor Settings**

	er rated speed	rev/min	Interm	ediate rated	d speed	Gontrol-	Lower	rated speed Control rod	③ <sup>To</sup>	rque control Centrol rod
Degree of deflection of control	travel	travel mm rev/min		İ		lever deflection	rev/min	travel mm	rev/min	travel mm
lever	mm 2	3	4	5	6	in degrees 7	8	9	10	11
									1	
	<b></b>		-							
29										

### C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Fu	II-load stop	6 Rotational- speed limitat. 3a Fuel delivery characteristics				Starting fuel delivery 5 4 Idle stop				
Test oil te rey/min 1	emp. 40°C (104°F) cm³/1000 strokes 2	Note: changed to) rev/min 3	rev/min	cm³/1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes 7		Control rod travel mm 9		
			ŀ	·						
				•						
				<b></b>						

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 9,6  $\bar{k}$ 3. Edition

PE 6 P 100 A 320 LS 805

RQ 1100 PA 440 R

RSV 650-1200 P 1/820

(1)

supersedes 10.80

company:

Daimler-Benz

engine:

OM 401

6 - 3 - 5 - 2 - 4- 1

(2)

±0,50°

(1) 116 kW (158 PS) (2) 129 kW (175 PS)

 $0 - 45 - 120 - 165 - 240 - 285^{\circ} (\pm 0.75^{\circ})$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings 3,40-3,50

Cy1.6

Port closing at pres	stroke	3,40-3,50 (3,35-3,55)	mm (from BDC)							
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6				
1050	10,4	10,0 - 10,2	0,3(0,6)	10,3	9,7 - 9,9	n = 1180				
350	+0,1 7,8-8,0	2,3 - 2,8	0,3(0,5)	+ 0,1 5,8-6,0	0,7 - 1,3	n = 650				

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

RQ .. 440

(1)

Upper rated	speed	•	Intermediat	e rated sp	eed	Lower rated	speed		Cliding	iesve travel
Degree of deflection of control	rev/min Control rod travel	Control rod travel	of control		Control rod travel	Degree of deflection of control		Control rod travel	Silding 1	①
lever	mm	rev/min (2	lever	rev/min	mm (4)	lever	rev/min	mm (3)	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
	9,4	1120-1129	-	_	-	-	_	-	-	-
	4,2	1160-1170						1		
	1300	0 - 1			•	<u> </u>				
İ										
						<b>3a</b>				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil te		Rotational-speed 2b limitation intermediate speed	high idle speed 55			fuel delivery 6	Torque- travel	Control rod
rev/min	cm³/1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1050	100,0-102,0 ( 98,0-104,0)	1120-1125*		dis	100 - 1165 persi	110,0-130,0 - 4,2 mm RW on max.4(6)		
								•/,

Chucking values in brackets

\* 1 mm less control rod travel then col. 2

2.82

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
C by Robert Bosch GmbH, D-7 Stuttgart 1, Postfach 50 Printed in the Federal Republic of Germany Imprime en République Fédérale d'Alemagne par Robert Bosch GmbH.

64

#### **B. Governor Settings**

Degree of deflection of control lever	r rated speed Control rod travel mm		Intermed	fiate rated	speed	Control- lever deflection in degrees		rated speed  Control rod  travel  mm	IL V /	rque control Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0				ca.31	650	5,7		
	x =	4,3	,				650-720	= 2,0		
ca.61	9,3 4,1 1340	1215-1225 1245-1260 0,3 - 1,7								

Speed difference between control-rod travel 1,0 mm and 4,0 mm = 25-35 min/1 C. Settings for Fuel Injection Pump with Fitted Governor\_

	ili-load stop emp. 40°C (104°F)	Rotational- speed limitat.	39 Fu	el delivery aracteristics	Starting f	stop Control rod		
rev/min	cm <sup>3</sup> /1000 strokes 2	changed to) rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	travel mm 9
1180	97,0-99,0 (95,0-101,0)	1215-1255*			100	110 - 130		

Checking values in brackets

Testoil-ISO 4113

\* / mm less control rod travel than col. 2

#### **B. Governor Settings**

(1) Uppe	r rated speed	Interm	ediate rat	rated speed 4 Lower rated			er rated speed	ed speed 3 Torque contro		
Degree of deflection	Control rod travel	Control rod travel				Control- lever		Control rod travel		Control rod travel
of control lever 1	mm 2	mm rev/min	4	5	6	deflection in degrees 7	rev/min 8	mm 9	rev/min 10	mm 11
					<u></u>		1			
			l						-	
		•	_							:
			İ							
<b>(2a)</b>										
			- 1			1			1	•

#### C. Settings for Fuel Injection Pump with Fitted Governor

<b>U</b>	II-load stop	6 Rotational- speed limitat.		el delivery paracteristics	Starting t	uel delivery 5		stop
Test oil te rev/min 1	emp. 40°C (104°F) cm³/1000 strokes 2	Note: changed to) rev/min 3	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes 7	rev/min	Control rod travel mm
							•	
								•
	•						l	ļ.

Checking values in brackets **En** 

\* 1 mm less control rod travel than col. 2

WPP 001/4

MAN 11,1 L5

Edition

PES 6 P 120 A 320 LS 403

RQV 250-1100 PA 488 (1)

superseded . 80

company: MAN

engine: D 2566 MKUL

235,4 Kw (320 Ps)

6 - 2 - 4 - 1 - 5 - 30 - 60- 120-180-240-300  $\stackrel{+}{-}$  0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel injection Pump Settings (2,95-3,15)

Port closing at pres		2,95-3,15) 3.00-3.10	mm (from BDC)			
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (1) cm³/100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	14,0+0,	1 22,0 - 22,4	0,5 (0,9	)		
250	7,5-7,7	- 1,2 - 1,8	0,8 (1,2)			
1100/650/50	0/500	C, 4-5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in [

#### **B.** Governor Settings

Upper rated :				Intermediate	rated sp	eed	Lower rated speed					
	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	(a) (2a)	Degree of deflection of control lever	rev/min 5	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Sliding s	mm 1	
					-		+	8	9	10	11	
max.	1100	15,2-17 0 - 1,		-	-	-	ca.15	100 250	min. 9,1 7,5-7,7	250 500	1,0 3,4-3,6	
ca. 68		1140-11 1225-12			,					1 <b>1</b> 50	7,8	
							360 <b>-</b> 495					

Torque control travel a =

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil ter		ininadon —	Fuel deli high idle	very characteristics 5a	Starting idle switching	$\sim$	Torque- travel	control 5	
rev/min 1	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm	
LDA 750	1,0 bar 220,0-224,0 (217,0-227,0)	1140-1150*	LDA 650 LDA	1,0 bar 212,0-218,0 0,29 bar	100	215,0-235,0	1100 1000 925	9 12,5+0 13,1+0 13,6+0	
LDA 1100	1,0 bar 185,0-191,0 (182,0-194,0)		500 LDA 500	138,0-144,0 0 bar 115,0-119,0			750	14,0+0	
haskin a	alues in brackets			Check values Page 2					

\* 1 mm less control rod travel than co! 2

Geschäftsbereich KM. Kundendienst. Kfz-Ausrustung. E. by Robert Bosch GmbM. D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany. Imprime en Republique Federale d'Allemagne par Robert Bosch GmbM.

#### D. Adjustment Test for Manifold Pressure Comp attor

Test at n =

500

rev/min decreasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
403 / 488	1,0	0,58 0,29 0	14,0- 14,1 13,4- 13,7 11,7- 11,8 10,8- 10,9

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

#### Check value - Fuel-delivery characteristics

LDA 1,0 bar

(209, 0 - 221, 0)

650 1/min LDA 0,29 bar 500 1/min

(135, 0 - 147, 0)

LDA 0 bar

500 1/min

(112, 0 - 122, 0)

6

Testoil-ISO 4113

Test Specifications Distributor-type **Fuel-injection Pumps** 

WPP 001/4 FOR 3,5 a 1. Edition

VE 6/10 F 1800 R 11

0 460 406 002

Overflow temperature 45° C

supersedes

company: engine:

Ford CTD 216

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

mm

2. Test Specifications checking values in brackets (

Test Instructions and Test Equipment

see VDT-W-460/...

Pre-stroke setting

1. Settings	Rot. speed rev/min	Settings		Charge-air press. bar (kgf/cm²)	Difference in delivery cm <sup>3</sup>
1.1 Timing device travel	1600	4,9-5,3	mm		
1.2 Supply-pump pressure	1600	6,1-6,6	bar (kgf/cm²)		
1.3 Full-load delivery with	1750	37,0-38,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
charge-air pressure .Full-load delivery without			cm <sup>3</sup> /1000 strokes		
charge-air pressure 1.4 Idle regulation	300	16,0-20,0	cm <sup>3</sup> /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 70,0	cm <sup>3</sup> /1000 strokes		
1.6 Start	2000	10,0-16,0	cm <sup>3</sup> /1000 strokes		
1.7 Load-dependent port-closing					

2.1 Timing device	n = rev/min mm	1000 1,7-2,7(1,5-2,9) (4	1600 1,4-5,8)	1800 5,4-6,1(5,0	-6,4)			
2.2 Supply pump	n = rev/min bar (kgf/cm²)	1000 4,2 <b>-</b> 4,8		1800 6,7-7,2				
Overflow delivery	n = rev/min cm <sup>3</sup> /10 s	500 55-111(40-126)		1800 55-111(40-126)				
2.3 Fuel deliveries				3. Dimen	Sions for assembly			
Speed control lever	Rot. speed rev/min	Fuel delivery   cm <sup>3</sup> /1000 strokes	Charge-air press. bar (kgf/cm²)	Designation	and adjustment mm			
End stop	2100-2200 2000 1900 1750 1250 800 285	0 (9,0-17,0) 28,0-34,0 (27,0-35,0) (35,2-39,8) 42,0-44,0 (40,7-45,3) 36,5-39,5 (35,7-40,3) max. 35,0		K KF MS SVS	3,2-3,4 5,9-6,1 2,0-2,2 max.5,1			
switch-off	1800	0		B	10,2±2,5 10,3±1,6			
idle stop	460-530 300	0 (14,0-22,0)		Observations	<u> </u>			
End stop	215	min.70,0						
2.4 Solenoid	cut-in voltage	10 V ted voltage 12 V						

Pump/engine assignment:

Adjustment by means of pointer and marker plate

Pointer setting with plunger lift 0.87 mm referenced to outlet "F"

Adjustment by means of notched plates

Setting of upper notched plate with plunger lift 0.22 mm referenced to outlet "F"

# 3

# Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MAN 20,9h1

4. Edition

Testoil-ISO 4113

PE 12 P 120 A 520 LS 843 RQ 900 PA 494 (1) supersedes<sub>4.80</sub>
RZU 750 P1/15R (2) company: MAN
engine: D25 42 MLE
12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 + 0.50

 $12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 + 0,50 \\ 0 - 45 - 60 - 105 - 120 - 165 - 180 - 225 - 240 - 285 - 300 - 345 ( 0,75)$ 

384,0kW(522PS)(1) 319,9kW(435PS)(2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15)

mm (from BDC)

Cyl. 12

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	10,8-10,9	17,6 - 18,0	0,5(0,8)	10,5-10,6	-	n 700
300	4,2-4,4	1,7 - 2,3	0,8(0,7)	-	1,7 - 2,3	250
·	•					

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

RQ 900 PA 494 (1)

Checking PRG che	g of slider ck Control re	<b>1</b>	Full-load speed regulation  Setting point   Test specifications   Control   Control   Lost town   Lost			cifications (4)	Idle spec	-		cifications 5	Torque control  Control rod		
rev/min 1	travel		rev/min 3	rod travel mm 4	rod travel	rev/min 6	rev/min	rod travel	rev/min 9	Control rod travel mm	rev/min	travel	
850	19,2-	20,8	850	20,0	9,8	900-905					900	5,0	
1000	0 -	1,0	VH ca	. 49°	4,0	927-936					•		

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

governor	delivery on control lever imp. 40°C (104°F)	Control rod stop 3a	Fuel deliv	ery characteristics	b) St	tarting fo	uel delivery
rev/min	cm <sup>3</sup> /-1000 strokes 2	rev/min	rev/min	cm <sup>3</sup> /-1000 strokes 5			Control red travel cm <sup>3</sup> /1000 strokes:/ mm 7
850	176, 0 - 180, 0 (173, 0 - 183, 0)		, , ,			100	19,5-21,0 RW
						300	17,0-23,0
							·

Checking values in brackets

①

**B.** Governor Settings

		oettii;							) RZU 750	_P1/1:	5R
Upper rated	speed		_ !	Intermediate	rated spe	ed	Lower rated	speed		Sliding sleeve travel	
Degree of deflection of control		Control rod travel	(ta)	Degree of deflection of control		Control rod travel	Degree of deflection of control	<u> </u>	Control rod travel		0
lever	mm	rev/min	(2a)	lever	rev/min	mm 4	lever	rev/min	mm 3	rev/min	mm
1	2	3		4	5	6	7	8	9	10	
	9,5	750			ļ						
	4,0	765-773	}						'		
	850	0-1									
							(3a)				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil tem		Rotational-speed (2b) limitation intermediate speed	Fuel delivery characteristics 5a high idle speed 5b		Starting Idle switchin		Torque- travel	control 5
rev/min	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travel mm 9
700	10,5-10,6 mm RW	750*						

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### **B. Governor Settings**

Upper rated s	peed			Intermediate	rated spe	ed	Lower rated	speed		Studing s	eeve travel
deflection of control	Control rod travel	Control rod travel mm rev/min	la) (2a)	Degree of deflection of control lever		travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	1
1	<b>i</b> i	3	<b>6</b>	4	_	6	7	8	9	10	11
							(3a)				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		Rotational speed (2b) imitation intermediate speed	Fuel deliv	rery characteristics 5a speed 5b	Starting Idle switching		Torque- travel	Control rod
rev/min	cm <sup>3</sup> /1000 strokes	rev/min (4a)	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>4</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

\* 1 mm less control rod travel than col 2

**@** 

# Test Specifications Fuel Injection Pumps 2 and Governors

40

WPP 001/4 MAN 11,10 2

2. Edition

**Testoil-ISO 4113** 

PES 6 P 110 A 720 LS295

RQ 250/1100 PA422 DR RQV 250-1100 PA421DR supersede7.78
company.MAN-Saviem
D 2566 MTSF
(206 kW - 230 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke

(2,95-3,15)

mm (from BDC)

	(-)					
Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,1	14,6 - 14,8	0,4(0,8)			
	+0,1					
250	6,8-7,0	0,9-1,5	0,4(0,7)			
700/500		C, 4-5	0,6(1,0)			

A: ,ust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

RQ..422DR

PRG che	Checking of slider PRG check Control rod travel rev/min 1  Control rod travel rev/min 2  Full-load speed r Setting point rev/min rev/min 3			•	cifications (4) rev/min 6	Idle speed regulation Setting point Control rod travel rev/min 7    Test specifications   Control rod				Control rod travel mm 11 12 + 0,1		
600	19,2-20,8	600	20,0	11,2	1145-1160	250	6,9	100	min. 8,5	1100	12,1	
1100	Breakaway	VH ca	.49 <sup>0</sup>	4,0	1200-1230			250	6,8-7,0	1000	12,4	
1300	0 - 1							370- 440	410 =2,0 0 - 1	800 700	,	

Torque-control travel
on flyweight assembly dimension a =

0,3

Speed regulation: At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

governor	lelivery on control lever mp. 40°C (104°F)	Control rod stop 3a	Fuel delive	ery characteristics 3b	Starting f	uel delivery d
rev/min 1	cm <sup>3</sup> /-1000 strokes	rev/min 3	rev/min 4	cm <sup>3</sup> /-1000 strokes 5	Chang	e-over point <sup>Commu</sup> cm <sup>3</sup> /1000 strokes:/mm 7
LDA 1100	0,7 bar 146,0 - 148,0 (143,0 - 151,0		LDA 500	0,2 bar 123,0 - 127,0 (120,0 - 130,0)	100	215,0 - 235,0
700	157,0 - 161,0 (154,0 - 164,0)		LDA	0 bar 111,0 - 113,0 (108,0 - 116,0)	100-1	70 (80-190)

Checking values in brackats

9.78

#### **B. Governor Settings**

MAN 11,1<sub>0</sub>2 RQV..421DR

Upper rated s	peed	•	Intermediate rated speed			Lower rated	speed		Clidion	lagua traval
deflection	rev/min Control rod travel	Control rod ta	Degree of deflection of control		Control rod travel	Degree of deflection of control		Control rod travel	Silving s	leeve travel
	mm 2		lever 4	rev/min 5	mm 4 6	lever 7	rev/min 8	mm 3 9	rev/min 10	mm 11
ca. 68	1100 1400	15,2-17,8 0 - 1	-	-	-	ca. 16	250	min.8,5 6,9-7,1	250 300	0,9-1,1 5,3-5,5
ca. 66	11,1 4,0	1140-1150 1245-1275					700	580=2,0 0 - 1	1140	8,3
						(3a)				

Torque control travel a =

mm

see C, 8

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil tem	stop ip. 40°C (104°F) (2)	Rotational-speed (2b) limitation intermediate speed (4a)	Fuel deliv character high idle s	ristics	Starting Idle switchin	fuel delivery 6	Torque- travel	control 5
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	.rev/min	cm <sup>3</sup> /1000 strokes	rev/m <sub>in</sub>	
1	2	3	4	5	6	7	8	9
LDA 1100	0,7 bar 146,0-148,0 143,0-151,0)	1140-1150 *	LDA 500	0,2 bar 123,0-127,0 (120,0-130,0)	100	215,0-235,0	1100 850	12,1 12,4
700	157, 0- 161, 0 (154, 0- 164, 0)		LDA 500	0 bar 111,0-113,0 (108,0-116,0)	100-	170 (80-190)	700	12,8

Checking values in brackets

\* 1 mm less control rod travel than col. 2 -

#### D. Adjustment Test for Manifold Pressure Compensator

Test at n =

rev/min decreasing pressure - in bar gauge pressure

Pump/governor ~	Setting	Measurement	Control rod travel-
	Gauge pressure = bar	Gauge pressure = bar	mm
295 / 421DR + 422DR)	0,68	2 22	12,8 - 12,9
		0,32	12,3 - 12,4
		0,20	11,5 - 11,7
		0	10,9 - 11,0

TEX/Pu

# Test Specifications Fuel Injection Pumps 1 and Governors

WPP 001/4 MAN 20,9 a

1. Edition

Testoil-ISO 4113

PE 12 P 100 A520/4 LS823 RQV 250-1200 PA 353R

PE 12 P 100 A520/4 LS834 RQ 750 PA392R

supersedes

companyM A N

+0,50

engine: D 2542 ME

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 0 - 45 - 60 - 105 - 120 - 165 - 180 - 225 - 240 - 285 - 300 - 345 (±0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at pres	. 4	.05-3.25)	mm (from BDC)		Cyl. 12	
Rotational speed rev/min	,	Fuel delivery **823** cm²/100 strokes 3	Difference cm³/ 100 strokes	Control rod travel mm 2	Fuel delivery "834" cm³/100 strokes 3	Spring pre-tenzioning (torque-control valve) mm 6
1200	13,8	10,8 - 11,0	0,3(0,6)	12,0	9,1-9,3	n = 700
	(40.1)			(.0.1)		

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

10,5 (+0,1)

250

ROV .. 353

Upper rated s	peed			Intermediate	rated spe	ed	Lower rated	speed		Sliding sleeve travel	
deflection	rev/min Control rod travel	mm -	2	Degree of deflection of control		Control rod travel	Degree of deflection of control		Control rod travel		0
lever		rev/min (2			rev/min	mm 4	lever	rev/min	mm (3)	rev/min	mm
1	2	3	_	4	5	6	7	8	9	10	11
ca.68	1200 1500	15,2-17,8 0 - 1	3	-	-	-	ca.11	100 250	min.7,5 5,9-6,1	800	0,3-1,2 4,8-5,2
ca.66		1240-1250 1355-1385						490- 700	550=2,0 0	1230	8,2
	7,0	1000-1000					<u>3</u> a				_

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		limitation intermediate speed			Starting Idle switchir		Torque- travel	Control 5  Control rod travel	
rev/min	cm <sup>3</sup> /1000 strokes .	rev/min (4a)	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	mm	
1	2	3	4	5	6	7	8	9	
1200	108,0-110,0 (106,0-112,0)				100	19,5-21,0 mm RW			
								./.	

Checking values in brackets

\* 1 mm less control rod travel then col. 2

11.77

Upper rated s	peed			Intermediate	ed	Lower rated	speed		Slidings	eeve travel	
deflection		travel		Degree of deflection of control		Control rod travel	Degree of deflection		Control rod travel	J. J. J. J. J. J. J. J. J. J. J. J. J. J	①
of control lever	mm	rev/min (			rev/min	mm 4	of control lever	rev/min	mm (3	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
ca.30	11,0 8,7	750-75! 770-780	1	-	-	-	-	-	-	750	5,3
	900	0 - 1									
					,		(3a)				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-rod Test oil tem		Rotational-speed (2b) limitation intermediate speed	Fuel deliv	very characteristics 5a speed 5b	Starting Idle switchir		Torq. e- travel	control 5
rev/min	cm <sup>3</sup> /1000 strokes 2	rev/min 4a)	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min	cm3/1000 strokes	rev/min 8	travel mm 9
700	91,0 - 93,0 (89,0 - 95,0)	750-755*			100	19,5-21,0		
				dis	775 persi	8,6-8,8 on max.4(6)		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### **B.** Governor Settings

Upper rated s	peed			Intermediate	rated spe	ed	Lower rated	speed		Slidings	leeve travel
deflection	rev/min Control rod travel	Control rod	(ta)	Degree of deflection of control		Control rod travel	Degree of deflection of control	ı	Control rod travel	Gilding 5	1
	mm	rev/min	(2a)	lever	rev/min	mm 4	lever	rev/min	mm 3	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
							33)				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil ter		intermediate speed	Fuel deln high idle :	very characteristics 5a speed 5b	Starting Idle switching		Torque- travel	Control rod
rev/min	cm <sup>3</sup> /1000 strokes	rev/min (4a)	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>4</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	8
İ								
						l		
			İ					
Ł	1	l	1		<u>                                     </u>		1	

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 16,0 e 1. Edition

PE 10 P 100 A 320 LS 811

RQV 350-1250 PA 251R

supersedes16,0c -12.72 company: Daimler-Benz

PE 10 P 100 A 320 LS 821

RQV 350-1250 PA 182R

OM 403 engine:

206 kW (320 PS)

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 0 - 45- 72- 117-144-189-216-261-288-333°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings
3,40-3,50
(3,34-3,55)
mm

Cyl. 10

		13.34=3.331				
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm
1000	12	11,7 - 12,4	0,4			
600	9	5,0 - 6,2	7	<u> </u>		
600	15	15,3 - 17,0				
200	9	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

251 R

deflection	rev/min Control	Control rod	<b>(19</b> )	Intermediate Degree of deflection	rated sp	control rod travel	Lower rated Degree of deflection	speed	Control rod travel		
of control lever	rod travel mm 2	mm rev/min 3	29	of control lever 4		mm 4 6	of control lever 7	rev/min 8	mm 3 9	rev/min 10	mm 11
ca.68	1265 1320 1400 1520	15,0-18 10,2-14 2,5- 9 0	,8	•	-	-	ca.17	350	8,7-11,0 5,7- 7,9 3,0- 4,5	1285	8,3
							(3a)				į

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roe Test oil ten		Rotational-speed (2b) timitation intermediate speed	Fuel deliv	very characteristics (5a) speed (5b)	Starting Idle switchin	$\mathbf{O}$	Torque- travei	Control co
rev/min	cm³/1000 strokes .	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
1230	98,0-100,0 (96,0-102,0)	1290-1305*	1230*	* 76,0-78,0 (74,0-80,0)	100	110-130 1390:4 mm RW		
** Se	t at the redu	ced-delivery	stop.	. 4.59	F 3 10	i iliax. U		
					200-2	50(180-270)		./.

Checking values in brackets

\* 1 mm less control rod travel than col. 2

1.78

Geschäftsbereich KH. Kundendienst. Kfz-Ausrustung. C by Robert Bosch GmbH. D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany Imprime en République Federale d'Allemagne par Robert Bosch GmbH.

Upper rated s	Upper rated speed Intermediate					ed	Lower rated	speed		Sliding sleeve travel	
Degree of deflection of control lever	Control rodtravel	Control rod travel mm rev/min		Degree of deflection of control lever	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel 3	ا	mm
ca.68	1265 1320 1400 1520	15,0-18 10,2-14 2,5-9	8,	-	•	-	ca.17	200 350 600 900	8,7-11,0 5,7- 7,9 3,0-4,5 0	1285	8,3

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ter		Rotational-speed (2b) imitation intermediate speed	Fuel deliv high idle s	very characteristics (5a)	Starting Idle switching		Torque- travel	Control roo
rev/min	cm³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm3/1000 strokes	rev/mළා	travel mm
-1	2	3	4	5	6	7	8	9
1230	98,0-100,0 (96,0-102,0)	1290-1305*		dis	persio	110,0-130,0 (108,0-132,0) -1390:4mm RW on max. 6 250(180-270)		

Checking values in brackets

\* 1 mm less control rod travel than col 2

#### **B.** Governor Settings

Upper rated s	speed			Intermediate	rated spe	ed	Lower rated	speed			Sliding sl	eeve travel
Degree of deflection of control lever		Control rod travel mm rev/min 3	(la) (2a)	Degree of deflection of control lever	rev/min	travel	Degree of deflection of control lever	rev/min 8	Control rod travel mm (	3 —	rev/min	mm
							<b>3</b> a					

Torque control travet a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		Rotational-speed (2b) imitation intermediate speed	Fuel delive high idle s	very characteristics 5a speed 5b	Starting Idle switchia		Torque- travel	control (5)
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>4</sup> /1000 strokes	rev/min 8	Control rod travel mm
	-		·					
						(		

Checking values in brackets

\* 1 mm less control rod travel than col 2

# **Test Specifications** Fuel Injection Pumps 2 and Governors

WPP 001/4 1. Edition

PE 6 P 100/820 LS 125

RQ 175/1000 PA 80 DR (1)

PE 6 P 100/820 LS 130

RQ 175/1000 PA 87 DR (2)

company:

**Enasa** 

engine:

supersedes

D 9105 (1) D 9109/1 (2)

(240 PS)

with W 420/304, page 8 Full-load values as indicated by Enasa

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

Test LDA (manifold-pressure compensator) in accordance

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

		Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
	1000	12	12,4 - 13,2				
	600	15	17,3 - 19,0				,
	200	9	3,6 - 4,6				

Adjust the fuel delivery from each outlet according to the values in

**B. Governor Settings** 

RQ..80 DR (1)

PRG che rev/min 1	Control rod travel mm	Full-load : Setting po rev/min 3	•	•	rev/min	Idle spec Setting p rev/min 7	Control rod travel	Test spe	cifications 5 Control rod travel mm	Torque o	Control rod (3) travel mm
450	15,7-16,3	450	16,0	1000 1030 1060 1110		•	0	100 150 250 300	6,0-8,0 4,6-6,8 0 -2,6 0	700	15,9-16,0 15,3-15,6 14,7-15,0

Torque-control travel

0,4 <sub>mm</sub>

Speed regulation: At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

governor	delivery on control lever mp. 40°C (104°F)	Control rod stop 3a	Fuel deliv	ery characteristics	<u>3b</u>	Starting f	
rev/min 1	cm³/~1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /-1000 strokes 5		rev/min 6	Control rad travel cm <sup>3</sup> /1000 strokes:/ mm
(1)							
ca. 1	nm RW - Adjust	according to th	e engi	ne records.			
							./.

Checking values in brackets

10.77

#### **B** Governor Settings

RQ.. 87 DR (2)

Checkin	g of slider	Full-load Setting po	•	•	cifications (4)	Idle spe	_		cifications (5)	Torque o	control (3)
rev/min 1	Control rod travel mm 2	rev/min	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rud travel		Control rod travel	rev/min 11	travel
400	16,5-17,1	400	17,0	1030	15,0-15,5	400	0	175	6,0-8,0		
				1130	0			350	0		

Torque-control travel on flyweight assembly dimension a

0,4

Speed regulation At

1 mm less control rod travel

#### C. Settings for Fuel Injection Pump with Fitted Governor

governor c	ull-load delivery on overnor control lever est oil temp 40°C (104 F)		Control rod stop 3a	Fuel delive	ery characteristics	3ъ)	Starting for	uel delivery d Control
rev/min	cm <sup>3</sup> /- 1000 strokes 2		rev/min 3	rev/min 4	cm <sup>3</sup> /-1000 strokes 5		rev/min 6	rod travel cm <sup>3</sup> /1000 strokes / mm 7
(2) LI 700 LDA 1000	0A 0,53 bar 167,0-169,0 0,72 bar 157,0-161,0			LDA 700	0 bar 146,0-148,0			

Checking values in brackets

#### D. Adjustment Test for Manifold Pressure Compensator

Testatn =

500

rev/min decreasing pressure - in bar gauge pressure

	inc easing		
Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure bar	Gauge pressure bar	mm (1)
130 / 87 DR	0,24		

Notes

\_ (1) when ភ 😑

rev/min and gauge pressure

bar (= maximum full-load control rod travel)

En

Testoil-ISO 4113

# **Test Specifications Fuel Injection Pumps** and Governors

VDT-WPP 001/4 VOL 6,0 d 3. Edition

En

PES 6 MW 100/320 RS 5

RWV 300-1400 MW 18

supersedes

7.77

Cam sequence and angular cam spacing.

Volvo company

1-5-3-6-2-4 -0-60-120-180-240-300 ±0,5°(±0,75°)

D 60 A engine

See page 2!

' All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,5-2,6 (2,45-2,65)

mm (from BDC)

10,5 Control rod travel

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (compensating valve)
rev/min	mm	cm <sup>3</sup> /100 strokes	cm <sup>3</sup> /100 strokes	mm	cm³/100 strokes	mm
1	2	3	4	2	3	6
1400	9,1	7,1 - 7,3	0,35(0,6)			
	(± 0,1)					
300	5,0	0,9 - 1,3	.0,35(0,55)			
	(± 0,1)					
600		C, col.4-5	0,5(0,7)			

Set uniform delivery according to the values in

Checking values in brackets

#### **B. Governor Settings**

Lower rated sp	eed		Upper rated sp	eed		Variations in co	ntrol rod trav	el
Degree of deflection of control	Control rod travel	Rotational speed	Degree of deflection of control	Control rod travel	Rotational speed		Rotational speed	Control rod travel
lever	mm	rev/min	lever	mm	rev/min		rev/min	mm
1	2	3	4	5	6	7	В	9
(2)	mind9,5 5,0 ith cont - 0	290-310 act310	82 7 ± 4 8 9 40 <sup>+5</sup> 10	9,1 8,1 4,0 max.1,0	1410 1410-1450 1500-1520 1550-1610	(2) (3) (4) (6)	100 1300 1200 1050 Switching po 180-23	20,5-21,5 9,0- 9,2 9,1- 9,3 9,7- 9,9

#### C. Settings for Fuel Injection Pump with Governor Mounted

Full-load d	delivery (19)		Variations delivery	in fuel (17)	Starting tidle	luel delivery	-
Test oil ter rev/min 1	mp. 40°C (104°F) cm³/1000 strokes 2	rev/min	rev/min	cm <sup>3</sup> /1000 strokes		cm <sup>3</sup> /1000 strokes	Difference cm <sup>3</sup> /1000 strokes 8
1400	71,4-73,4 (69,4-75,4)	1440-1450* (1435-1455)	600	58,8-63,8 (57,8-65,8)	100 300	mind.140 9,8-13,8 (7,3-16,3)	3,5 (5,5)
Shooting							(16

Checking values in brackets

 $(\pm 0.1)$ 

less control rod travel than in Column 2

5.82

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50. D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Federale d'Allemagne par Robert Bosch GmbH.

-2-

Note:

VOL 6.0 d

Sliding-sleeve idle travel 4.15 - 4.35 mm

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 VOL 7.0 f

3. Edition

PE 6 P 110 A 320 RS 367

RQV 250-1100 PA 435/2R(1)

supersedes company:

5.79 Volvo

250-1200 PA 435 R(2)

TD 70 F

(1)169<sup>nqi</sup>kW (230PS) (2)157 kW (213PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

# A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15)

mm (from BDC)

RW 10,5

Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
10,7	9,7 - 9,9	0,4(0,8)	10,8	10,0-10,2	2,5 ± 0,1**
+0,1			+0,1		(max.2,2-2,9)
4,7-4,8	0,9 - 1,3	0,3(0,6)	4,7-4,8	0,9 -1,3	
	C. 4-5	0,6(1,0)			
	mm 2 10,7 +0,1	travel mm cm³/100 strokes 2 10,7 9,7 - 9,9 +0,1 4,7-4,8 0,9 - 1,3	travel cm <sup>3</sup> /100 strokes cm <sup>3</sup> / 100 strokes 2 cm <sup>3</sup> / 100 strokes 4 10,7 9,7 - 9,9 0,4(0,8) +0,1 4,7-4,8 0,9 - 1,3 0,3(0,6)	travel cm³/100 strokes 2 cm³/ 100 strokes 4 cm³/ 100 strokes 4 mm 2 2 10,7 9,7 - 9,9 0,4(0,8) 10,8 +0,1 +0,1 4,7-4,8 0,9 - 1,3 0,3(0,6) 4,7-4,8	travel   cm³/100 strokes   cm³/ 100 strokes   mm   cm³/100 strokes

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

250-1100

Upper rated s	peed		Intermediate	rated sp	eed	Lower rated	speed		Sliding	leeve travel
Degree of deflection		Control rod travel	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel	Shows a	1
of control lever	rod travel mm 2	mm rev/min 2s 3	of control lever	rev/min 5	mm 4	of control lever	rev/min	mm 3	rev/min	mm
<u> </u>	<del>                                     </del>		<del> </del>	<del>                                      </del>		<del></del>	<u> </u>	3	10	11
ca.68	1100	15,2-17,8	-	-	-	ca.11	100	min.7,0	250	1,6-1,8
	1450	0 - 1					250	4,7-4,8	800	4,9-5,3
65		4440 4450					365-	425= 2,0		
ca.65	9,7	1140-1150 1225-1255				_	700	0 - 1	1150	7,7
						<b>3</b> a				

In the case of greater dispersion alter the delivery-valve spring pre-tension

# accordingly. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed			Starting Idle switchir		Torque- travel	control 5	
rev/min	cm³/1000 strokes	rev/min 48	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	travel mm	
1	2	3	4	5	6	7	8	9	
LDA	0,7 bar 97,0-99,0 (94,0-102,0)	1140-1150*	LDA 700	0 bar 77,0-79,0 (74,0-82,0) dis	100 250 persi	165,0-200,0 11,0- 15,0 on max.3 (6)			
						<b>i</b>		•/•	

Checking values in brackets

\* 1 mm less control rod travel then col. 2

10.80

BOSCH

Upper rated s	speed		Intermediate	rated spe	ed	Lower rated	speed		Slidino s	leeve travel
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min (2a)	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	1
1	2	3	4	5	6	7	8	9	10	11
ca.68	1200	15,2-17,8	-	-	-	ca.11	100	min.6,3		
	1450	0 - 1					250	4,7-4,8		
ca.64	9,8 4,0	1240-1250 1320-1350				300-415				
	.,0	1020 1000				<u>За</u>				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Contro	d delivery -rod stop temp. 40°C (104°F) 2 cm <sup>3</sup> /1000 strokes 2	Rotational-speed (2b) limitation intermediate speed rev/min 3	characteristics high idle speed 5b rev/min cm³/1000 strokes		ldle switchir	fuel delivery 6  ng point cm <sup>3</sup> /1000 strokes	Torque- travel rev/min 8	Control 5  Control rod travel mm 9
LDA 700	0,7 bar 100,0-102,0 ( 97,0-105,0)	1240-1250*	LDA 700	0 bar 78,0-81,0 75,0-84,0)	100 250	165,0-200,0 11,0- 15,0		
						<b>I</b>		

Checking values in brackets

#### D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure

Pump/governor	XXXXXXX Setting	Measurement	diminution Control rod travel-
	Gauge pressure = bar	Gauge pressure = bar	difference mm
367 / 250 (1100)	0,18	0,08	10,4 - 10,5 9,9 - 10,0
367 / 250(1200)	0,7	0,34 0,24 0	10,8 - 10,9 10,5 - 10,6 10,0 - 10,2 9,7 - 9,8

En

Testoil-ISO 4113

<sup>\* 1</sup> mm less contrôl rod travel than col. 2

Festoil-ISO 4113

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 Vol 10.0 h 2 3. Edition

PE 6 P 110 A 320 RS 229 RQV 250 - 1100 PA 403/2R RS 229Z/RQV 250- 1100 PA 427/2R

supersedes

2.81

company:

Vol vo THD 100TD

engine:

177 kW(240PS)

In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly. All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel injection Pump Settings
(2,55-2,75)
Port closing at prestroke
2,60-2,70 mm

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strakes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4 +0,1	13,9 - 14,1	0,4(0,8)			2,5+0,1** (max.2,2-2,9)
250 700	6,1-6,2	1,4 - 1,8 t. C, col. 4,5	1			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated s	speed			Intermediate	rated sp	eed	Lower rated	speed		Stidings	leeve travel
deflection	rev/min Control rod travel mm 2	mm	(S)	Degree of deflection of control lever	rev/min	Control rod travel mm 4	Degree of deflection of control lever	rev/min B	Control rod travel mm 3	rev/min	mm
ca.68	1100 1350	15,2-17, 0 - 1	,8				ca.13	100 250 325-	min.9,0 6,0-6,1 385=2,0	200 500 800 1100	0,7-0,9 3,0-3,3 5,2-5,5 8,0
ca.48	10,4 4,0	1160-117 1240-127					<b>3</b> a)				<b>5,0</b>

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-roo Test oil ten		limitation intermediate speed	high idle speed (5)		idle switchin	ng point	travel	control 5  Control rod travel
1	2	rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	mm 9
LDA 700	0,6 bar 139,0-141,0 (136,0-144,0)		LDA 700	0 bar 112,5-115,5 (109,5-118,5	250	290,0-340,0 16 - 20** ersion max.3		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

5.81

BOSCH

#### **D. Adjustment Test for Manifold Pressure Compensator**

-2-

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure

VOL 10,0 h 2

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
229 / 403/2R 229Z / 427/2 R	0,33	0,25	11,1 - 11,2 10,4 - 10,5

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 VOL 10,0h1 2. Edition

PE 6 P 110 A 320 RS 229

RQV 250-1000 PA 427 R

supersades

10.79 Vol vo

company:

THD 100 D

1 - 5 - 3 - 6 - 2 - 4 0 -60 -120-180-240-300

engine:

(176,5kW-250PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

RW 10.5

Cv1. 1

		(-,00 %,70/		INN IO	,	<del></del>
Rotational spec rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4-11,6	13,9 - 14,1	0,4(0,8)			2,5 ± 0,1**
250	6,0-6,1	0,9 - 1,3	0,3(0,7)			max.2,2-2,9
700	-	C. 4-5				
	e case of	greater dispers	ion alter	the del	very-valve spr	ing pre-tension

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

Upper rated s	speed		Intermediate	rated sp	eed	Lower rated	speed		Slidings	leeve travel
Degree of deflection	rev/min Control	Control rod travel	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel	Choing a	1
of control lever	rod travel	rev/min 2a	of control lever	rev/miń	mm 4	of control lever	rev/min	mm ③	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.68	1050 1350	15,2-17,8 0,0- 1,0				ca.12	100 250	min.7,7 6,0-6,2	250 440	1,1-1,2 2,5-2,9
ca . 44		1060-1070 1135-1165					325-	385= 2,0	1070	8,2
						<b>3</b> a				

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

rev/min cm³/1000 strokes rev/min cm³/1000 strokes rev/min cm³/1000 strokes rev/min cm³/1000 strokes rev/min cm³/1000 strokes rev/min cm³/1000 strokes rev/min cm³/1000 strokes rev/min m s s s s s s s s s s s s s s s s s s	Full-load de Control-roc Test oil ten		top   limitation   high idle speed (5)		$\mathbf{\circ}$	Torque- travel	control 5		
LDA 0,6 bar 700 139,0-141,0 (136,0-144,0) 1060-1070* LDA 0 bar 700 112,5-115,5 100 290,0-340,0 (109,5-118,5)	rev/min	cm³/1000 strokes .	rev/min 48	rev/min	cm <sup>3</sup> /1000 strokes		cm <sup>2</sup> /1000 strokes	rev/min	travel mm
		139,0-141,0			112,5-115,5	100	290,0-340,0 11 - 15**		-

Checking values in brackets

\* 1 mm less control rod travel than col. 2

11.80

#### **D. Adjustment Test for Manifold Pressure Compensator**

-2-

Test at n =

500

rev/min decreasing pressure – in bar gauge pressure

VOL 10,0 h 1

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
229 / 427 R	0,6		11,4 - 11,5
		0,325	11,1 - 11,2
		0,285	10,4 - 10,5
		0	10,0 - 10,1

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 MB 11,4 m 1. Edition

En

PES 6 P 110 A 820 LS 433

RSV 350-750 P1/487

supersedes [

company DB

om 407 A engine 157 kW (213 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

(2,95-3,15)3,00-3,10

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes	Control rod travel mm	Fuel delivery  cm <sup>9</sup> /100 strokes	Spring pre-tensioning (torque-control valve)
700	13,4	16,6 - 16,8	0,4(0,8)			6
350	+0,1 6,6-6,8	1,1 ~ 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

1 Uppe	er raiced speed		Interme	diate rated	speed	4	Lowe	r rated speed	(3) 10	orque control
Degree of deflection of control lever 1	travel mm	Control rod travel mm rev/miri	4	5	6	Control- lever deflection in degrees 7	rev/min	Control rod travel mm	rev/min	Control rod travel mm
loose	800=	0,3 - 1,0			<u> </u>					
ca.35	750-755 785-795 850-0,3	5= 4,0								

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

	ull-load stop emp 40°C (104°F)	6 Rotational- speed limitat		uel delivery haracteristics	Starting fuel delivery 5 4a Idle s			
rev/min	cm <sup>3</sup> /1000 strokes 2	changed to ) rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min .	cm#1000 strokes 7	rev/min 8	Control rod travel mm
700	166,0-168,0 (163,0-171,0)	750-755*			100	130,0-150	0	

Checking values in brackets

\* 1 mm less control rod travel than col 2

**BOSCH** 

Geschaftsbereich KH. Kundendienst. Kfz-Ausrustung < 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en Republique Federale d'Allemagne par Robert Bosch GmbH.

estoil-ISO 4113

# **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/ MB 11,4i2

1. Edition

PES 6 P 120 A 820 LS 3077

RQV 300-1100 PA 601

supersedes

Daimler-Benz company:

OM 407 A

engine: 206 kW(280PS)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Cy1.6

Port closing at prestroke

(3.95-4.15)

mm (from BDC)

	Rotational speed rev/min	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 atrokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
l	1100	12,0+0,1	18,5 - 18,7	0,5(0,9)			·
	300	5,0-5,2	1,2 - 2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated s	speed	1		Intermediate	rated spe	eed		Lower rated	speed			Slidings	leeve travel
Degree of deflection of control	rev/min Control rod travel	mm	1 <u>a</u>	Degree of deflection of control		Control re travei	od	Degree of deflection of control		Control re travel	od _	Onding 3	1
lever	mm	rev/min (	2a)	lever	rev/min	mm	4	lever	rev/min	mm	(3)	rev/min	mm
1	2	3		4	5	6		7	8	9		10	11
ca.68	1100 1350	15,2-17,8 0 - 1,0		-	-	-		ca.11	100 300	min.6	,5	300 500 800	1,7-1,8 3,2-3,5 4,6-5,0
ca.63		1140-1150 1190-1220						340-440		٠		1100	7,1
								<b>3</b> a					

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roe Test oil ten		intermediate speed	high idle s		ldie switchir	ng point	travel	Control rod travel
1	2	rev/min 😙 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	mm 9
LDA 1100	0,7 bar 185,0-187,0 (182,0-190,0		LDA 600 LDA 500	0,7 bar 187,0-193,0 (184,0-196,0) 0 bar 144,0-146,0 (141,0-149,0)		155,0-175,0		

Checking values in brackets

\* 1 mm less control rad travel then col. 2

#### D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n =

500 rev/min decreasing pressure – in bar gauge pressure

MB 11,4 i 2

Pump/governor	Setting		diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
LS 3077 / PA 601	0,7	0,42	12,4 - 12,6 12,2 - 12,3
		0,30	11,3 - 11,4
		0	10,7 - 10,8

Notes:

(1) when n =

rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Testoil-ISO 4113

**Testoil-ISO 4113** 

## **Test Specifications** Fuel Injection Pumps 1 and Governors

VDT-WPP 001/4 2. Edition

PES 8 P 100 A 921/5 RS 286 (920/5)

RQV 300-1300 PA 304 KR .. 305, 308, 309... supersedes

company: engine:

1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je  $45^{\circ}$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

Rotational speed	travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm <sup>3</sup> /100 strokes	100 strokes	mm	cm <sup>3</sup> /100 strokes	mm
1	2	3	4	2	3	6
1000	12	11,4 - 12,0	0,4			
600	15	16,2 - 17,8				
200	6	2,9 - 3,9				
					Į Į	

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

**RQV..304KR** 

Upper rated s	speed			Intermediate	rated sp	eed	Lower rated	speed	•	Sliding sleave trave	
Degree of deflection of control	rev/min Control	Control rod travel	<b>(a)</b>	Degree of deflection of control		Control rod travel	Degree of deflection of control		Control rod travel		
laver	rod travel mm	rev/min	<b>(2a)</b>		rev/min	mm (4)	lever	rev/min	mm (3)	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
ca.66	1320 1400 1500 1640	15,0-17 9,5-13 1,8- 8 0	,8	-	-	-	ca.10	120 250 400 540 680	6,9-8,0 5,2-7,4 2,2-3,8 0,2-1,6	250 500 800 1320 1520- 1640	0,4-1,4 2,8-3,4 4,4-4,8 8,2 End (11)

Torque control travel a =

--- see C, 8

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel deliv	rery characteristics 5a	Starting Idle switchin		Torque- travel	control 5 Control rod
rev/min	cm³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travei mm
1	2	3	4	5	6	7	8	9
LDA 1300	0,85 bar 78,5-80,5	1340-1350*	LDA 900	0,85 bar 96,5-100,5	100 300	190 - 230 8 - 11	1300 900	
} :			LDA 800	0 bar 53,0-59,0	L	ge-over point 240 min-1		

Checking values in brackets

\* 1 mm less control rod travel then col. 2

6.75

Geschäftsbereich KM: Kundendienst. Kfz-Ausrüstung.
c by Robert Bosch GmbH. D-7 Stuttgart 1, Postfach 50 Printed in the Pederal Republic of Germany.
Imprime en République Fédérale d'Allemagne par Robert Bosch GmbH.

①

Upper rated s	speed			Intermediate	rated spr	∌ed		Lower rated	speed		Cliding	alogue travel
Degree of deflection of control lever	rev/min Control rodtravel mm	Control rod travel mm rev/min	$\sim$	deflection of control	rev/min	Control root travel mm		Degree of deflection of control lever	rev/min	Control rod travel	3 rev/min	mm
1	2	3		4	5	6		7	8	9	10	11
ca.66	1320 1400 1500 1640	15,0-17, 9,5-13, 1,8- 8,	,8	-	-	-		ca.10	120 250 400 540 680	6,9-8,0 5,2-7,4 2,2-3,8 0,2-1,0	4   500 8   800	0,4-1,4 2,8-3,4 4,4-4,8 8,2
				1			1	33				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil tem		Rotational-speed (2b) limitation intermediate speed	Fuel deliv	very characteristics 5a speed 5b	Starting idle switchin		Torque- travel	Control cod
rev/min 1	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm3/1000 strokes	rev/min 8	travel mm
LDA 1300	0,9 bar 74,0-76,0 (72,0-78,0)	1340-1350*	LDA 850 LDA 800	0,9 bar 107,0-111,0 (105,0-113,0 0 bar 54,5 - 60,5	Chan	190-230 8-11 ge-over point 240 min <sup>-</sup> 1	1300 850	9,4

Checking values in brackets

\* 1 mm less control rod travel than col 2

#### **B. Governor Settings**

**RQV..308 KR** 

Upper rated s	peed			Intermediate	rated spe	ed		Lower rated	speed			Stiding	leeve travel
	rev/min  Control  rod travel	Control rod	(ta)	Degree of deflection			-	Degree of deflection	ı	Control r	od	1	
lever	mm	rev/min	(2a)	lever	rev/min	mm		of control lever	ten/win	mm	(3)	rev/min	mm
1	2	3		4	5	6		7	8	9		10	11
ca.66	1320 1400 1500 1640	15,0-1 9,5-1 1,8- 0	3,8		-	-		ca.10	120 250 400 540 680	6,9-6 5,2- 2,2-2 0,2-	7,4 2,8	250 500 800 1320	0,4-1,4 2,8-3,4 4,4-4,8 8,2
		<u> </u>						3 <b>a</b>					

Torque control travel a ≈

See C, 8

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roc Test oil terr		intermediate speed	Fuel delin high idle s	very characteristics 5a speed 5b	Starting Idle switchin		Torque- travel	control 5
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 4a)	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm²/1000 strokes 7	rev/min 8	travel mm 9
LDA 1300	0,9 bar 109,0-111,0 (111,0-113,0)	1340-1350*	LDA 900 LDA 800	0,9 bar 110,5-114,5 (109,5-116,5) 0 bar 54,0-60,0	Chan	190 - 230 8 - 11 ge-over point 240 min-1	1300 900	12,1 11,4

Checking values in brackets

\* 1 mm less control rod travel than col 2

estoil-ISO 4113

#### **B.** Governor Settings

			<u> </u>	<del></del>							
Upper rated s	peed			Intermediate	rated spe	ed	Lower rated	speed	1	Sliding sleeve travel	
deflection of control	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3		Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever	rev/min 8	Control rod travel mm 3	rev/min	mm 11
ca.66		15,0-17 9,5-13 1,8-8 0	8,8	-	-	-	ca.10	120 250 400 540 680	6,9-8,0 5,2-7,4 2,2-3,8 0,2-1,6	500 800	0,4-1,4 2,8-3,4 4,4-4,8 8,2

RQV ...309 KR

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ten		Rotational-speed 2b fimitation intermediate speed	character high idle s	istics	Starting Idle switchin	fuel delivery 6	Torque- travel	Control roo
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min (4a)	rev/min 4	cm <sup>3</sup> /1000 strokes 5	.rev/min	cm <sup>3</sup> /1000 strokes 7	rev/min 8	travel mm 9
LDA 1300	0,85 bar 93,0-95,0 (95,0-97,0)	1340-1350*	LDA 900 LDA 800	0,85 bar 106,5-110,5 (104,0-112,5 0 bar 80,5- 86,5	Chan	8- 11 ge-over point	1300 900	11,1 11,3

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### D. Adjustment Test for Manifold Pressure Compensator

Testatn = 800

rev/min decreasing pressure - in bar gauge pressure

Pump/g	overr	or		Setting		Measurement		diminution Control rod travel- difference
				Gauge pressure =	bar	Gauge pressure =	bar	mm
286	/	304	KR	0,07-0,13		0,46-0,54		+0,1 / - 0,1
286	1	305	KR	0,18-0,23		0,57-0,65		+0,1 / - 0,1
286	1	308	KR	0,11-0,16		0,68-0,75		+0,1 / - 0,1
286	/	309	KR	0,18-0,24		0,49-0,57		+0,1 / - 0,1

The respective control-rod travel for induction and with charge-air pressure must be read off in accordance with Section C for LDA (manifold-pressure compensator) adjustment test, paragraph D!

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 DAF 11,6 d

5. Edition

PE 6 P 110 A 320 RS240

RQV 200-1100 PA197R RQ 200/1100 PS196R RQ 250/1100 PA196R supersedes 2.75 DAF

engine:

DKB 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

( +0,15

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	13,2-13,9	0,5			
600	9 12 15	6,4- 7,6 13,2-14,7 19,0-20,9				
200	9	4,8- 6,0				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

**RQV.. 197R** 

Upper rated :	peed	•		Intermediate	rated sp	eed	Lower rated	speed		Sliding sleeve trave	
Degree of deflection of control lever	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	(a) (28)	Degree of deflection of control lever	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3	rev/min	mm
ca.68		14,8-17,1 10,2-14,1 5,7-10,4 0 - 7,1	2	•	-	-	ca.12	100 200 300 500 700	6,3-8,0 4,4-6,8 3,3-4,8 1,7-3,1 0		

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-toad d Control-ro Test oil ter		Rotational-speed 2b limitation intermediate speed	Fuel deliv	very characteristics 5a speed 5b	Starting Idle switchin	• 0	Torque- travel	control 5
rev/min	cm²/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
LDA 850	0,7 bar 136,0-139,0 (134,0-141,0)	1120	LDA 600	0 bar 115,5-118,5 (113,5-120,5		260-280		
					200	29 - 37		
				·	200	29 - 37		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Checkin	g of slider	Full-load	speed re	gulation	_	idle spe	ed regula	ation	_	Torque o	control	1
PRG che	ck (1)	Setting po	oint	Test spe	cifications (4)	Setting	point	Test spe	cifications (5)		(3	9
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel rmm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel	rev/min	Control rod travel mm 12	
500	15,7-16,3	500	16,0	1120 1150 1180 1230	8,5-14,0 0-9,3		0	100 200 300 340	6,6-8,1 4,2-6,3 0 -2,1 0	-	-	
	ontrol travel	ISION A =		mm	Soc	ed regula	ation At				1 mm less conti	-

# C. Settings for Fuel Injection Pump with Fitted Governor

113		trol travel t assembly dimension a = ttings for Fuel	mm Injection Pum	-	regulation At  h Fitted Go	veri	or	1 mm less control rod travel
<b>J</b> 41	Full-load de	elivery on	Control rod stop 3a	E	ery characteristics	<b>@</b>	Starting f	uel delivery 6
-IS(	rev/min	cm <sup>3</sup> /-1000 strokes 2	rev/min 3	rev/min	cm <sup>3</sup> /-1000 strokes 5		rev/min 6	cm <sup>3</sup> /1000 strokes / mm
Festoil-	*	See page 1!						
Tes								
لــــا								

Checking values in brackets

#### **B.** Governor Settings

#### RQ 250/111ββ PA196R

Checkin	g of slider	Full-load	speed re	gulation	_	Idle spec	ed regula	ation	_	Torque o	control
PRG che rev/min 1	Control rod travel	Setting por rev/min 3	Control rod travel mm	Test spec Control rod travel mm 5	rev/min	Setting prev/min	Control rod travel		cifications 5 Control rod travel mm	rev/min	Control rod travel mm
660	15,7-16,3	660	16,0	1120 1160 1220 1280	15,6-16,0 9,0-14,0 0 - 7,0 0	670	0	300	6,5-8,1 4,8-6,8 1,2-3,7 0	-	-

Torque-control travel on flyweight assembly dimension a =

Speed regulation At

1 mm less control

#### C. Settings for Fuel Injection Pump with Fitted Governor

	elivery on control lever np. 40°C (104°F)	Control rod stop	Fuel deliv	ery characteristics	Starting f	uel delivery d Control
rev/min	cm <sup>3</sup> /-1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /-1000 strokes 5	rev/min 6	cm <sup>2</sup> /1000 strokes / mm 7
	*					

En Checking values in brackets

#### **D. Adjustment Test for Manifold Pressure Compensator**

DAL11,6d -

Test at n =

500

rev/min decreasing pressure – in bar gauge pressure

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
240 / 196R 240 / 197R	0,29-0,31		-0,1

Notes:

(1) when n =

revimin and gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Festoil-ISO 4113

VDT-WPP 001/4 1. Edition

PES 8 P 100 A 921/5 RS 286 (920/5)

ROV 30--1300 PA 263 K 264,265,266 supersedes

company: I H C - U S A engine: DVT 800

1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je  $45^{\circ}$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8+0,1

mm (from BDC) (-0.05)

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,4 - 12,0	0,4			
600	15	16,2 - 17,8				
200	6	2,9 - 3,9				

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

RQV .. 263, 264,265,266 KR

Upper rated s	speed			Intermediate	rated sp	eed	Lower rated	speed		Sliding	leeve travel
Degree of deflection of control	rev/min Control rod travel	Control rod travel	<b>(18)</b>	Degree of deflection of control		Control rod travel	Degree of deflection of control		Control rod travel	Silding	1
lever	mm	rev/min	<b>(28)</b>	iever	rev/min	mm (4)	lever	rev/min	mm (3)	rev/min	mm
1	2	3	_	4	5	6	7	8	9	10	11
ca.66	1310 1400 1500 1650	15,0-17, 9,2-13, 1,7- 8, 0	3	-	•	-	ca.10	100 250 350 500 630	6,8-8,0 4,6-6,8 3,0-4,8 1,4-2,7	300 500 800 1310 1520-	1,1-2,1 2,2-2,8 4,6-5,0 8,2 End
							<b>3</b> a			1640	(11)

Torque control travel a =

see C, 8

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil ten		Rotational-speed (2b) limitation intermediate speed	Fuel deli- high idle :	very characteristics 5a	idle	fuel delivery 6	Torque- travel	control 5
rev/min	cm³/1000 strokes .	rev/min (4a)	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
See p	age 2!							

Checking values in brackets

\* 1 mm less control rod travel than col. 2

12.75

#### C. Settings for Fuel Injection Pump with Fitted Governor

	elivery d stop np 40°C (104°F)	Rotational-speed limitation	Fuel dela	very characteristics	Starting fuel delivery Idle switching point	Intermed rotationa Torque-c travel	speed
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min cm <sup>3</sup> /1000 strokes	rev/min	mm
1	2	3	4	5	6 7	В	
286 /	263KR:						
LDA 1300	0,85 bar 86,5-88,5	1340-1350*	LDA 900 400	0,85 bar 95,5-99,5 67,5-71,5	100 190 - 230 300 8 - 11	1300 900	10,5 10,3
			LDA 400	0 bar 40,5-46,5	** 170-240 Ü/min	400	9,2
286 /	264KR:		•				
LDA	0,85 bar	4240 4250+	LDA	0,85 bar	100 190 - 230	1300	9,4
1300	75,0-77,0	1340-1350*	900 700	91,0-95,0 76,0-80,0	300 8 - 11	900	10,0
			LDA	0 bar	**	700	9,4
			400	35,0-41,0	170-240 U/min		
286 /	265KR:		·		arting the first section of the sect		
LDA	0,85 bar	4040 40-01	LDA	0,85 bar	100 190 - 230	1300	9,0
1300	71,0-73,0	1340-1350*	800 600	103,0-107,0 81,5-85,5	300 8 - 11	800	10,8
			LDA	0 bar	**	600	10,1
			400	38,5-44,5	170-240 U/min		·
286_/	266KR:						
LDA	0,85 bar	1340-1350*	LDA	0,85 bar	100 190 - 230	1300	11,1
1300	93,5-95,5		900	96,5-100,5	300 8 - 11	900	10,4
			700 LDA	81,5- 85,5 0 bar	**	700	9,8
			400	35,0-41,0	170-240 U/min	, 00	

LDA (manifold-pressure compensator) adjustment - Section D) - Page 3!

(increase by  $\pm$  1,0 cm<sup>3</sup>!)

\*\* Change-over point

Checking values in brackets

Testoil-ISO 4113

# Pe 286 / Regler 263 .. 268 KR **D. Adjustment Test for Manifold Pressure Compensator**

Test at n ≈

rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	diminution Control rod travel- difference			
	Gauge pressure = bar	Gauge pressure = bar	mm (1)			
			Induction Boost control-rod travel travel			
286 / 263KR	0,04 - 0,10	0,35 - 0,46	+ 0,1 / - 0,1			
286 / 264KR	0,04 - 0,10	0,35 - 0,46	+ 0,1 / - 0,1			
286 / 265KR	0,04 - 0,10	0,37 - 0,48	+ 0,1 / - 0,1			
286 / 266KR	0,04 - 0,10	0,35 - 0,46	+ 0,1 / - 0,1			

Notes: (1) when n =

500 500

rev/min and gauge pressure = 0,85

bar ( = maximum full-load control rod travel)

The respective control-rod travel for induction and with chargeair pressure must be read off in accordance with Section C for LDA (manifold-pressure compensator) adjustment test, paragraph D!

# Test Specifications Fuel Injection Pumps (A) and Governors

40

WPP 001/4 MWM 33,2 e 3. Edition

En

PE 8 P 130 ..LS3010,3015

EP/RSUV..332,333,338,339

supersedes 7.77

company

MWM, Süd Bremsen TBD 601.. K

PE 6 P 130 ..RS3011,3023,3031

engine

TBD 601.. K

..LS3026 Complete type designations and instructions page 4!
All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

2,80-2,90 (2,75-2,85)

mm (from BDC)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min 1	mm (2)	cm³/100 strokes 3	100 strokes	mm 2	cm <sup>9</sup> /100 strokes 3	mm 6
800	12	33,9 - 34,7	1,4			
600	6 15	10,5 - 11,9 42,7 - 45,4				
200	6	5,1 - 6,3				

Adjust the fuel delivery from each outlet according to the values in

**B.** Governor Settings

300 - 750

Degree of deflection of control lever	r rated speed Control rod travel mm	Control rod travel mm rev/min	Interme	diate rate	d speed	Control- lever deflection in degrees 7	Lower rev/min 8	rated speed  Control rod travel  mm  9	rev/min	rque control  Control rod  travel  mm
ca.68	750 775 800	16,0 11,5 6,0		without auxiliar spring with auxiliary spring			300 50 300	8,0 19 - 21	730	0
<b>2a</b>	820	9,5-11,5 3,0- 5,0 0,3- 1,0					350 420	7,7-8,3 2,7-5,1 0 - 1		1,2-1,8

The numbers denote the sequence of the tests

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop Test oil temp. 40°C (104°F)		6 Rotational-speed limital (3a) Fuel delivery characteristics			Starting fuel delivery 5 4a idle stop				
rev/min	cm <sup>3</sup> /1000 strokes 2	Note. changed to _) rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm#1000 strokes 7	rev/min	Control rod travel mm	
See	page 3	760							
								./.	

Checking values in brackets

\* 1 mm less control rod travel than col 2

10/78

BOSCH

Geschaftsbereich KH. Kundandienst. Kf2-Ausrustung. 1980 by Robert Bosch GmbH. Postfach 50, D-7000 Stuttgart 1. Printed in the Federal Republic of Germany Imprime en République Federale d'Allemagne par Robert Bosch GmbH.

K13

#### **B. Governor Settings**

12 " /	r rated spತಕರೆ Control rod travel mm	Control rod travel mm rev/min			Control- lever deflection in degrees	- Lower	I.		rque control Control rod travel mm	
ca.67	900	16,0	<del></del>		ca.27	300	8,0	10		
	930 950	9,8 5,8	with spri		out auxiliary	ry	50	19 - 21	880	0
29	930 960 1040	8,5-11,6 3,0- 5,8 0,3- 1,0	with auxiliary spring				300 350 440	7,7-8,3 2,6-5,0 0 - 1	330	1,2-1,8

# Testoil-ISO 4113

#### C. Settings for Fuel Injection Pump with Fitted Governor

IHoad stop		Ga Fuel delivery characteristics		Starting f	uel delivery 5	idle stop	
cm <sup>3</sup> /1000 strokes	changed to) rev/min 3	rev/min	cm³/1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes 7	rev/min 8	travel mm 9
age 3	910						
1	mp. 40°C (104°F) cm³/1000 strokes 2	mp. 40°C (104°F)  cm³/1000 strokes  2  speed limitat.  Note: changed to) rev/min  3	mp. 40°C (104°F)  cm³/1000 strokes  2  speed limitat. (Note: changed to) rev/min 3	mp. 40°C (104°F)  cm³/1000 strokes  2  speed limitat. Note: changed to) rev/min  rev/min  3  cm³/1000 strokes  5	mp. 40°C (104°F)  cm³/1000 strokes  2  speed limitat. Characteristics  rev/min  rev/min  cm³/1000 strokes  rev/min  5  6	mp. 40°C (104°F) cm³/1000 strokes 2  speed limitat. Note: changed to) rev/min rev/min 3  characteristics Idle rev/min cm³/1000 strokes 7  cm³/1000 strokes 7	mp. 40°C (104°F)  cm³/1000 strokes  rev/min  mp. 40°C (104°F)  cm³/1000 strokes  rev/min  speed limitat. Characteristics  changed to)  rev/min  frev/min

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### **B. Governor Settings**

Degree of deflection of control lever	r rated speed Control rod travel mm	rev/min  Control rod  travel  mm rev/min  3	Intermed	diate rated	speed 6	Control- lever deflection in degrees 7	Lower rev/min 8	rated speed Control rod travel mm	 rque control   Control rod travel   mm
29									,

## C. Settings for Fuel Injection Pump with Fitted Governor

(2b) Full-load stop		Rotational- speed limitat.	6 Rotational-speed limitat. 3a Fuel delivery characteristics			Starting fuel delivery 5 4a Idle st		
Test oil to rev/min	emp. 40°C (104°F) cm³/1000 strokas	Note: changed to) rev/min	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min	cm <sup>3</sup> /1000 strokes		Control rod travel mm
			ļ					
								·
		į						
	<u> </u>							

Checking values in brackets En

\* 1 mm less control rod travel than col. 2

#### C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load ଝିକ୍ଟvery Control-ros ନିର୍ମ Test oil temp ଓଡ଼ିକ (104°F)		Rotational-speed limitation			Starting Idle switchir	fuel delivery	Intermediate rotational speed Torque-control travel	
rev/min	cm³71000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes		mm
1	2	3	4	5	6	7	8	

TBD 601 - 6K Cyl.6 - Power output at speed

179 kW/243 PS / 1000/min.

500 277,0 - 279,0 510

240 kW/326 PS / 1000/min.

500 343,0 - 345 ,0 510

262 kW/356 PS / 1000/min.

500 388,0 - 390,0 510

215 kW/292 PS / 1200/min.

600 269,0 - 271,0 610

287 kW/390 PS / 1200/min.

600 357,0 - 359,0 610

312 kW/424 PS / 1200/min.

600 371,0 - 373,0 610

268 kW/364 PS / 1500/min.

750 259,0 - 261,0 760

356 kW/484 PS / 1500/min.

750 407,0 - 409,0 760

388 kW/527 PS / 1500/min.

750 435,0-437,0 760

420 kW/571 PS / 1800/min.

900 281,0-283,0 910

427 kW/580 PS / 1800/min.

900 378,0-380,0 910

468 kW/636 PS / 1800/min

900 434,0-436,0 910

#### INSTRUCTIONS

#### 1. Complete type designations and engine designations

PE 6 P 130 A 320 RS3011	EP/RSUV 300-900 P10 A339/1R	TBD 601/6K
PE 6 P 130 A 320 RS3031	EP/RSUV 300-750 P 9 A333/1R	TBD 601/6K
PE 6 P 130 A 300 RS3023		TBD 601/6K
PE 6 P 130 A 320 LS3025 (300)	EP/RSUV 300-750 P 9 A332/1R 300-900 P10 A338/1R	TBD 602 V12K
(300) PE 6 P 130 A 300 LS3026	300 300 FTO ASSB/TR)	
PE 8 P 130 A 500/5LS3010 PE 8 P 130 A 500/5LS3015	)	TBD 602 V16K

#### 2. Test details

Test equipment according to W 400/305 En: T-nozzles and tubing 8 x 2 x 1000 with delivery-valve holder on pump M 16 x 1.5

Basic governor setting: vertical position = 35° control lever deflection.

#### 3. Cam sequence and angular cam spacing

```
PE 5 P.. 3011, 3023, 3031:

1 - 5 - 3 - 6 - 2 - 4

0 -60 -120-180-240-300° (normal)

PE 6 P.. 3025:

1 - 6 - 2 - 4 - 3 - 5

0 -15 -120-135-240-255°

PE 8 P.. 3010:

1 - 6 - 8/2 - 4 - 7 - 3 - 5

0 -45 -90 -135-180-225-315°

PE 8 P..3015:

1 - 6 - 2 - 8 - 4 - 7 - 3/5

0 - 45-90 -180-225-270-315°
```

①

Testoil-ISO 4113

### **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 VOL 10,0 g 4. Edition

PE 6 P 110 A 320 RS229, Z RQV 200-1100 PA 60/2 R

RS229

200-1100 PA230/2 R

250-1100 PA232/2 R

supersedes 4.81

company: Volvo

engine: THD 100 D

Port-closing test with/without ROBO diaphragm

RS229, Z

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

#### A. Fuel Injection Pump Settings

Port closing at prestroke

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	15,3 - 15,9				
600	9 12 15	8,8 - 10,2 14,6 - 16,0 20,5 - 22,8				2,5 ± 0,1** (max.2,2-2,9)
200	9	6,1 - 7,5				

Adjust the fuel delivery from each outlet according to the values in

In the case of greater dispersion alter the delivery-valve spring pre-tension

## B. Governor Settings

229 mit 60/2 R

Upper rated s	speed		Intermediate	rated sp	eed	Lower rated	speed	-	Slidlag e	leeve travel
deflection	rev/min Control rod travel mm 2	Control rod travel mm rev/min 2a	Degree of deflection of control lever	rev/min	Control rod travel mm 4	Degree of deflection of control lever 7	rev/min	Control rod travel mm 3	rev/min	mm
ca.68	1150 1410 1100 1200 1260 1400	15,5-18,3 0 15,0-18,0 7,2-12,6 2,0-9,0				ca.23	100 200 300 400 460	7,0-10,0 5,0- 8,4 2,4- 5,2 0 - 2,2		7,8
	1400	U				<b>3a</b>				

Torque control travel a = mm abnorm. sldg-sleeve pos'n = 36,0 mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-ros Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel deliv	very characteristics 5a	Starting Idle switchin	•	Torque- travel	control 5
rev/min	cm³/1000 strokes .	rev/min 44	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travel mm
1	2	3	4	5	6	7	8	9
LDA 700	0,6 bar 139,0-141,0 (138,0-142,0)		LDA 700	0 bar 112,5-115,5 (111,5-116,5 disp		ca.290 14 - 20 n max.3		
								./.

Checking values in brackets

\* 1 mm less control rod travel than col. 2 3.82

B,	Go	۷ė	rno	r Se	ettii	ngs
		_				

B. Gov	ernor	Settings	<b>3</b>			2	29 /	230/2R		VOL 10,0	g
Upper rated s	peed		Intermedia	te rated sp	eed	Lower rated					7 -
Degree of deflection of control lever	rev/min Control rodtravel mm	travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Sliding s	leeve travel	
1	2	3	4	5	6	7	8	9	10	11	
ca.68	1150 1410	15,5-18,	3			ca. 23	100 200	7,0-10,0 5,0-8,4		7,8	
ca.66	1100 1200 1260	15,0-18,0 7,2-12,0 2,0- 9,0	5				300 400 460	2,4- 5,2 0 - 2,2	2		
	1400	0				(3a)		J			

Torque control travel a fidg-sleeve pos'n = 36,0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil tem		Rotational-speed (2b) Ilmitation intermediate speed	Fuel deln high idle s	rery characteristics 5a speed 5b	Starting Idle switching		Torque- travel	control 5
rev/min	cm <sup>3</sup> /1000 strokes 2	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes 5	rev/min	cm3/1000 strokes	rev/min 8	travel mm
LDA 700	0,6 bar 121,0-123,0	1160-1170*	LDA 700	0 bar 112,5-115,5 dis	200	ca. 290 14 - 20 on max. 3)**		·

Checking values in brackets

\* 1 mm less control rod travel than col 2

#### **6. Governor Settings**

232/2R

Upper rated s	peed			Intermediate	rated spe	ed	Lower rates	speed		Citation	
of control	rod travel	mm	(a)	Degree of deflection of control	1	travel	Degree of deflection of control		Control rod travel	Sliding s	leeve travel
lever	1	`	(Sa)	lever			lever	rev/min	mm (3)	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
ca.50	1170 1400	15,0-18 0	,3				ca.13	100 200	8,9-11,0 7,2- 9,9		8,3
ca.45	1100 1180	15,1-17 8,2-13						300 380	4,0-6,9		
	1260	-	,8					490	0 - 3,4 0		
	1360	0					За				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil ter		Rotational-speed 2b limitation intermediate speed	Fuel deli high idle	very characteristics 5a speed 5b		fuel delivery 6	Torque- travel	control 5
rev/min 1	cm³/1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1u00 strokes	rev/min	cm <sup>4</sup> /1000 strokes	rev/min	Control root travel mm
LDA 700	0,6 bar 139,0-141,0	1150-1170*	LDA 700	0 bar 112,5-115,5	100	ca. 290		
				dis	250 persi	14 - 20 on max. 3)**		
								,

Checking values in brackets

\* 1 mm less control rod travel than col. 2

D. GOTCHIOL OCCURS	В.	Govern	or S	ettin	gs
--------------------	----	--------	------	-------	----

	229Z	1	232/2R
--	------	---	--------

Upper rated	speed			Intermediate	rated spe	ed	Lower rated	speed		Sliding s	eeve travel
Degree of deflection of control lever		Control rod travel mm rev/min 3	$\sim$	Degree of deflection of control lever	rev/min	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel mm 3	rev/min	mm
ca.50	1170 1400 1100 1180 1280 1360	15,0-18, 0 15,1-17, 8,2-13, 0 - 7,	9				ca.13	100 200 300 380 490	8,9-11,0 7,2- 9,9 4,0- 6,9 0 - 3,4		8,3

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-roo Test oil tem	stop	Rotational-speed (2b) limitation intermediate speed	Fuel deliv high idle s	very characteristics 5a speed 5b	Starting idle switching	$\overline{}$	Torque- travel	Control rod
rev/min	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm3/1000 strokes	rev/min 8	travel mm 9
LDA 700	0,7 bar 148,5-150,5	1140-1150*	LDA 700	0 bar 117,0-120,0 dis	1	320,0-360,0 11,0- 11,0 on max. 2,5	**	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

#### **B.** Governor Settings

229Z mit 60/2R

Upper rated s	speed			Intermediate	rated spe	ed	Lower rated	speed		Sliding sl	eeve travel
Degree of deflection of control	rev/min Control rod travel	Control rod travel	(la)	Degree of deflection of control	Ì	Control rod travel	Degree of deflection of control	l	Control rod travel		1
lever	mm	rev/min (	(2a)	lever	rev/min	mm (4)	lever	rev/min	mm (3)	rev/min	mm
1	2	3		4	5	6	7	8	9	10	11
ca.68	1150 1410	15,5-18 0	,3				ca.23	100 200	7,0-10,0 5,0-8,4		7,8
ca.66	1100 1200 1260	15,0-18 7,2-12 2,0- 9	,6					300 400 460	2,4- 5,2 0 - 2,2 0		
	1400	0					<u>3</u>				

Torque control travel a = abnorm. sldg-sleeve pos'n = 36.0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load of Control-ro Test oil ter		intermediate speed	Fuel deliv	very characteristics 5a speed 5b	Starting Idle switchir		Torque- travel	Control roo
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min (4a)	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>4</sup> /1000 strokes 7	rev/min 8	travel mm 9
LDA 700	0,4 bar 121,0-123,0	1160-1170*	LDA 700	0 bar 103,5-106,5 dis	100 200 persi	ca.290 14,0-20,0 <sub>**</sub> ion max.3		
								./.

Checking values in brackets

\* 1 mm less control rod travel than col 2

VOL 10,0 g -4-

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
229 / 60/2R 229 / 232/2R	0,31-0,37	0,20-0,23	gs. Ann. Mil
229 / 230/2R	0,23-0,27	0,20-0,23	<b></b>
229Z / 60/2R	0,22-0,24	0,16-0,21	
229Z / 232/2R	0,48-0,52	0,29-0,32	en ev un

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

①

estoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 Vol 10,0 h

4. Edition

En

PE 6 P 110 A 320 RS 229 RS 229 RQV 250-1100 PA 402/2 R RQV 250-1100 PA 427/2 R supersedes

1.79 Volvo

company: engine:

THD 100 TD 155 kW (210PS)

\*\* In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2.60-2.70

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,2	12,1 - 12,3	0,4(0,8)			2,5+ 0,1**
250 700	+0,1 5,8-5,9	0,9 - 1,3 C, col.4-5	0,3(0,7) 0,6(1,0)			(max.2,2-2,9)

Adjust the fuel delivery from each outlet according to the values in

#### **B. Governor Settings**

Upper rated :	speed			Intermediate	rated spe	eed	Lower rated	speed	1	Sliding s	leeve travel
Degree of deflection of control lever	rev/min Control rod travel mm 2	mm			rev/min 5	Control rod travel mm 4	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 3	rev/min 10	① mm 11
ca.68	1100 1400	15,2-17,8 0 - 1	8				ca.17		285= 2,0	250 1170	0,4-1,2 8,3
ca.51	9,2 4,0	1160-117 1220-125		The same of the sa			(3a)	500	0 - 1		

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-ros Test oil ten	stop np 40°C (104°F) 2	Rotational-speed (2b) limitation intermediate speed	high idle s	peed 5b cm <sup>3</sup> /1000 strokes	idle switchir	<u> </u>	Torque- travel	Control Control rod travel
1	2	3	4	5	6	7	8	9
LDA 700	0,45 bar 121,0-123,0 (118,0-126,0		LDA 700	0 bar 112,5-115,5 (109,5-118,5)	250	290 - 340 11 - 16** persion max.	3	

Checking values in brackets

\* 1 mm less control rad travel than col. 2

8.80

BOSCH

rev/min decreasing pressure – in bar gauge pressure VOL 10,0 h 500 -2diminution Control rod travel-Pump/governor Setting Measurement difference Gauge pressure = bar | Gauge pressure = bar mm (1) 402/2 R 427/2 R 10,1 - 10,2 9,9 - 10,0 229 0,25 0,23

Notes:

(1) when n =

Test at n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 19,1 m 1. Edition

PE 12 P 110 A 320 LS 832

RQV 350-1150 PA 510

company:

Daimler-Benz OM 404 A

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7

 $0 - 45-80 - 105-120-165-180-225-240-285-300-345 \pm 0,5^{\circ}(+0,75^{\circ})$ 

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)! Port closing mark cyl. 12

	1	3.13-3.331				,
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	13,4+0,1	15,1 - 15,3	0,4(0,8)			
350	7,0- 7,2	1,1 - 1,7	0,4(0,7)			
			i			

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

Upper rated	i i	1_	_ 1	Intermediate	rated sp	eed	Lower rated	speed	1	Slidings	leeve travel
Degree of deflection of control lever	rev/min Control rod travel mm	mm .		Degree of daffection of control lever	rev/min	Control rod travel mm 4	Degree of deflection of control lever	rev/min	Control rod travel mm 3		0
ca.68	1150 18,4 4,0 1450	15,2-17, 1185-119 1295-132 0 - 1,	5	-	•	-	ca.20	350	min.8,6 7,0-7,2 -670=2,0	300 600	0,4-1,1 3,6-3,9 5,4-5,6 7,8

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ter		Rotational-speed 2b limitation intermediate speed	Fuel detiving high idle s	very characteristics 5a	Starting Idle switchir		Torque- travel	control 5
rev/min	cm³/1000 strokes	rev/min 48	rev/min	cm <sup>3</sup> /1000 strokes	i .	cm³/1000 strokes	rev/min	travel mm
·	2	3	4	5	6	7	8	_9
LDA*	0,7 bar	1185-1195*	LDA*	0 bar	100	120,0-140,0		
1130	131,0-133,0 (148,0-156,0)		450	114,0-116,0 (111,0-119,0		13,0- 19,0		
!								

Checking values in brackets

\* 1 mm less control rad travel than col. 2

3.81

Test at n =

500 rev/min decreasing pressure – in bar gauge pressure

MB 19,1 m

-2-

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
"S"832/PA 510	0,7 bar	0,35 bar 0,25 bar 0 bar	13,4 - 13,5 13,1 - 13,2 12,6 - 12,8 12,3 - 12,4

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

# Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 STE 10,0 d

1. Edition

En

PE 6 P 110 A 320 RS 157 RQV 250-550/1100 PA 140R

supersedes

company: Steyr

engine:

(vorm. Ustr.Saurer)

7 FA

235 kW (320 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(1,95-2,15)

mm (from BDC)

RW 10,5

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm³/ 100 strokes	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	17,5-18,1	<b>30,</b> 6			
600	6 12	2,2 - 3,2 16,1 -17,3				
200	6	0,4 - 1,4				

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

250-550/1100

deflection	rev/min Control rod travel mm	Control rod traval mm rev/min 2a	of control		Control rod travel mm 4	Lower rated Degree of deflection of control lever 7	speed rev/min 8	Control rod travel mm 3	Sliding s rev/min 10	mm
ca.66	1100 1150 1200 1300	12,0-15,0 6,8-11,2 0,4- 7,0 0 - 1	ca.48	320 580 620 670	10,7-11,7 4,5-11,6 0 - 6 0	ca.10	200 300 400 330	6,3-8,0 4,5-8,8 1,8-4,4 0	700-1	0,6-1,6 000= 8,4-8,6 8,5

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load d Control-ro Test oil ten		Rotational-speed 2b limitation intermediate speed	Fuel delightightightightightightightightightight	very characteristics 58	Starting Idle switching		Torque- travel	control 5
rev/min 1	cm <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm³/1000 strokes	rev/min	travel mm
LDA 1100	0,7 bar 177,0-179,0 (174,0-182,0)	1180	LDA 1100	0 bar 133,0-137,0 (130,0-140,0)	100	190-210	8	9

Checking values in brackets

\* 1 mm less control rad travel than col. 2

-2-

Testatn =

500

rev/min decreasing pressure – in bar gauge pressure

STE 10,0 d

Pump/governor	Setting  Gauge pressure = bar	Measurement  Gauge pressure = bar	diminution Control rod travel- difference mm (1)
157 / 140 R	0,25	0,7	1,8 mm

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

0

Festoil-ISO 4113

# Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 8,7p

1. Edition

PES 6 MW 100/720 RS 1101

RQV 300-1300 MW 44

supersedes

DB

0 403 446 134

company:

OM 362 LA

1 - 5 - 3 - 6 - 2 - 4 0 -60 -120-180-240-300 engine:

141 kW(192PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,20-3,30

mm (from BDC)

RW 9,0-12,0 mm

		[3.15=3.25]				
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /160 strokes 3	Difference cm³/ 100 strokes 4	Control rad travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1300	11,9+0,1	9,45-9,65	0,35(0,6)			
300 80%	6,0-6,1	1,05-1,45	0,35(0,55			
	11,9+0,1 10,2+0,1		0,5 (0,7) 0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

Upper rated	speed		Intermediate	rated sp	eed	Lower rated	speed		Stidings	leeve travel
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min (2a)	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel mm 3	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11.
max.	1330	15,2-17,8	-	-	-	ca.11	300	6,0-6,1		
	1600	0,1-1,0		:			100	min.7,6		
ca.64	10,9	1340-1350	1							
j	4,0	1435-1465					520-	580=2,0		
<u> </u>			<u>L</u>			<u>3a</u>				

Torque control travel a =

mn

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2 rev/min cm³/1000 strokes 1 2		Rotational-speed 2b limitation intermediate speed	Fuel delivery characteristics (5a) high idle speed (5b)		Starting idle switching		Torque- travel	Control rod travel mm
		rev/min 4a	rev/min	cm <sup>3</sup> /1000 strokes	rev/min cm <sup>3</sup> /1000 stroke:		rev/min	
LDA 1300	0,7 bar 94,5-96,5 (92,5-98,5)	1340-1350*	LDA 800 LDA 500	0,7 par 89,5-93,5 (87,5-95,5) 0 bar 54,5-56,5 (52,5-58,5)	100 300	min.80,0 10,5-14,5 280 (80-250)		

Checking values in brackets

\* 1 mm is so control rod travel than col. 2

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

MB 8,7 p

-2-

				vy. p
Pump/governor	Setting		Measurement	diminution Control rod travel- difference
	Gauge pressure =	bar	Gauge pressure = bar	mm (1) .
RS 1101 /	0,38			11,4 - 11,5
MW 44		:	0,7	11,9 - 12,0
			0	10,2 - 10,3
			0,3	10,7'- 10,8
				<u> </u>

Notes:

(1) when n =

rev/min and gauge pressure =

bar (= maximum full-load control rod travel)

①

## Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MAN 20,9 m 1. Edition

معــ

stoil-150 4113

PE 12 P 120 A 520 LS 836

ROV 250-1150 PA 439 R

supersedes companyMAN

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 0 -45 -60 -105-120-165-180-225 -240 -285-300-345 engine: D 2542 MLE 456 kW (620 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings (2,95-3,15)

Port closing at pres	troke	3.00-3.10	mm (from BDC)	RW 10,5		Cyl. 12
Rotational speed rev/min			Difference Contrave cm³/ 100 strokes mm 4		Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,3	18,5 - 18,8	0,5(0,9)			
	+0,1					
250	5,7-6,9	2,2 - 2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

#### **B.** Governor Settings

Upper rated s	peed		Intermediate rated speed			Lower rated	speed		Sliding s	ieeve travel
deflection	Control	Control rod (1a)	Degree of deflection		Control rod travel	Degree of deflection		Control rod travel		0
	rod travel mm	mm rev/min (28)	of control lever	rev/min	mm 4	of control lever	rev/min	mm ③	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1150 1400	15,2-17,8 0 - 1				ca. 11		min. 8,3 6,7- 6,9 545 =2,0	i I	
ca. 64	10,3 4,0	1190-1200 1275-1305				<b>3</b> a	100	010 -E,0		

Torque control travel a =

mm

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load de Control-rod Test oil ten		Rotational-speed 2b limitation intermediate speed rev/min 4a	Fuel delightightide s	very characteristics 5a speed 5b cm³/1000 strokes	idle	ng point	Torque- travel	Control rod travel
1	2	3	4	5	6	7	8	9
LDA 1150	0;7 bar 185,0-188,0 (182,0-191,0)	1190-1200*		·				
					100-	   170 (80-190) 		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

11.80

MAN 20,9 m -2-

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure

Pump/gov	Pump/governor		Setting		Measurement	diminution Control rod travel- difference	
			···	Gauge pressure =	bar	Gauge pressure = bar	mm (1)
836	/	439	R	0,7			11,3 - 11,4
						0,21	10,9 - 11,0
							·

Notes:

(1) when n =

rev/min and gauge pressure = bar (= maximum full-load control rod travel)

estoil-ISO 4113

## **Test Specifications** Fuel Injection Pumps 1 and Governors

WPP 001/4 MB 11,4 i 1

1. Edition

PES 6 P 120 A 820 LS 3077

Port closing at prestroke

ROV 300-1100 PA 605

0 supersedes

company:

Daimler-Benz OM 407 LA

engine: 235 kW (320 PS)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(3 05-1 15) mm (from BDC)

Cy1.6

Rotational speed rev/min	Control rod travel mm 2	Fuel delivery  cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,1+0,1	20,1 - 20,3	0,5(0,9)			
300	5,5-5,7	1,2 - 1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in [

#### **B. Governor Settings**

deflection	rev/min Control rod travel	Control rod tatravel mm rev/min (28	of control	rated sp	ced Control rod travel mm 4	Lower rated Degree of deflection of control lever	speed rev/min	Control rod travel	Sliding s	leeve travel
1	2	3	4	5	6	7	8	9	10	11
ca.68	1100 1350	15,2-17,8 0 - 1,0	-	-	-	ca.11	100 300	min.6,0 4,5-4,7	500	1,7-1,8 3,2-3,5
ca.63	12,1	1140-1150	-			325-415				4,6-5,0
<b> </b> 	4,0	1205-1235							1100	7,1
						<b>3</b>				

Torque control travel a =

#### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) 2		limitation intermediate speed	Fuel delivery characteristics 5a high idle speed 5b		Starting fuel delivery 6 Idle switching point		Torque-control 5 travel Control rod travel	
rev/min	cកា <sup>3</sup> /1000 strokes	rev/min 4a	rev/min	cm <sup>3</sup> /1000 atrokes	rev/min	cm <sup>2</sup> /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9
LDA	0,75. bar	1140-1150*	LDA	0,75 bar	100	170,0-190,0		
1100	201,0-203,0 (198,0-206,0)		675	195,0-201,0 (192,0-204,0				
			LDA	0 bar				
			500	148,0-150,0 (145,0-153,0)				

Checking values in brackets

\* 1 mm less control rod travel than col. 2

8.81

Geschäftsbereich KM. Kundendienst. Kfz-Ausfüstung. C. by Robert Bosch GmbM. D-7 Stuttgart 1, Postfach 50. Printed in the Federal Republic of Germany Imprime en Republique Federale d'Allemagne par Robert Bosch GmbM.

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

MB 11,4 i 1

Pump/governor	Setting	Measurement	diminution Control rod travel- difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1) .
••LS 3077 / ••PA 605	0,75	0,46 0,34 0	13,1 - 13,2 12,6 - 12,7 11,8 - 11,9 11,3 - 11,4

Notes:

(1) when n =

rev/min and gauge pressure = bar (= maximum full-load control rod travel)